APPENDIX D
Biological Assessment

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Biological Assessment of the
USDA Forest Service and USDI Bureau of Land Management
Land and/or Resource Management Plans
in the Northwest Forest Plan Area

INTRODUCTION

The Endangered Species Act (ESA) requires the USDA Forest Service (FS) and USDI Bureau of Land Management (BLM) to initiate consultation on FS Land and Resource Management Plans and BLM Resource Management Plans (hereafter both FS and BLM Plans are referred to as RMPs) following the listing of a species or designation of critical habitat. For proposed species or critical habitat, conferencing will assist the FS and BLM in identifying and resolving potential conflicts (50 CFR 402.10). Numerous consultations and/or conferences with the USDC National Marine Fisheries Service (NMFS) or USDI Fish and Wildlife Service (FWS) on the RMPs within the Northwest Forest Plan (NWFP) area have been conducted following the listing of a species or designation of critical habitat.

With the listing, proposed listing, and status review of numerous fish populations or critical habitat within the NWFP area, the executives of the FS, BLM, FWS and NMFS (hereafter referred to as NOAA Fisheries or NOAAF) met and agreed to a strategy for meeting present and future Section 7 responsibilities regarding the effects of the RMPs on the listed or proposed species, designated or proposed critical habitat, and candidate species for federal listing under ESA (USDA et al 1996). Interagency teams were assigned the task of completing biological assessments (BAs) for the FS National Forest (NF) and BLM District or Resource Area plans. Subsequently, the FS and BLM entered into formal consultation/conference on various RMPs. Numerous consultations and/or conferences on individual RMPs in the NWFP area with NMFS or FWS were concluded on the RMPs that addressed most of the species considered in this Biological Assessment (BA). For a more complete description of the consultations, see the consultation history section of this BA (Section 3.1).

The purpose of this BA is to assess the effects of the continued implementation of BLM and FS RMPs in the NWFP area, and the Preferred Alternative (Alternative A) of a Final Supplemental Environmental Impact Statement (FSEIS) (USDA and USDI in press) which would amend the NWFP Aquatic Conservation Strategy (ACS) currently integrated within the RMPs, on ESA-listed or candidate fish species and proposed or designated critical habitat. Although the FSEIS has not yet been issued, the proposed action as described in the Draft SEIS (USDA and USDI 2003) has been modified and will be described herein as "Alternative A" in the FSEIS. In addition, the tribal lands of the Coquille Forest in Oregon will be included in this BA. The purpose is discussed in more detail in section 5 of the BA. There are 30 FS and BLM RMPs including the Columbia River Gorge National Scenic Area (CRGNSA) and the King Range National Conservation Area (KRNCA) Plans within the NWFP area (Figure 1). The 30 RMP actions are grouped or batched with the intent to summarize the previous assessments and consultations so they can be addressed in a consistent manner in subsequent NOAAF and FWS

Figure 1. Northwest Forest Plan Area

Biological Opinions (BOs). In addition to addressing previous consultations and conferences on the RMPs as outlined by the executive strategy for species and critical habitat, the BA addresses a Preferred Alternative (Alternative A) that would amend the 30 RMPs (USDA et al 1996).

The Secretaries of Agriculture and the Interior are proposing to amend the ACS portions of the RMPs except for the CRGNSA within the Northwest Forest Plan area. The CRGNSA Plan would be indirectly affected by the Preferred Alternative (Alternative A) since only the NF RMPs within the CRGNSA would be amended (see BA section 5.11 for details regarding CRGNSA). The Preferred Alternative (Alternative A) of the Final Supplemental Environmental Impact Statement for *Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan; National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl* (USDA and USDI in press) is assessed and evaluated with the RMP actions previously assessed for ESA consultation and summarized in this BA. Under the amendment, land managers continue to be required to design projects to comply with applicable standards and guidelines (S&Gs) in Sections C and D of Attachment A in the Record of Decision (ROD) (USDA and USDI 1994b), and other applicable standards in Resource Management Plans. No further finding of ACS consistency is required. The amendment requires the project record to demonstrate how the agency used relevant information from applicable watershed analysis to provide context for project planning. The purpose of this Preferred Alternative (Alternative A) is discussed in more detail in section 5.2 of the BA.

SCOPE OF THE CONSULTATION OR CONFERENCE

The FS and BLM administrative units addressed in this BA are described in section 2.1. The listed or proposed species, designated or proposed critical habitat, and candidate species for federal listing under ESA considered in this BA are listed in section 2.2 as well as the status and federal register notice for each of the species or critical habitats. The species and/or critical habitats affected by each individual administrative unit are displayed in section 2.3.

FS and BLM Administrative Units

This BA addresses 30 FS and BLM RMPs in the Northwest Forest Plan area. The 30 RMPs consist of 19 National Forests (NFs), 9 BLM Districts or Resource Areas, the Columbia River Gorge National Scenic Area (CRGNSA) Plan and the King Range National Conservation Area (KRNCA). The 30 RMPs or Plans are as follows:

Bureau of Land Management:

District	Resource Area	National Conservation Area
Coos Bay	Arcata	King Range
Eugene	Klamath Falls	

Medford
Roseburg
Salem
Redding
Ukiah

Forest Service:

National Forest	National Forest	National Scenic Area
Deschutes	Rogue River	Columbia River Gorge
Gifford Pinchot	Six Rivers	
Klamath	Siskiyou	
Lassen	Shasta-Trinity	
Mendocino	Siuslaw	
Modoc	Umpqua	
Mt. Baker-Snoqualmie	Wenatchee	
Mt. Hood	Willamette	
Okanogan	Winema	
Olympic		

Most of the administrative units are entirely within the NWFP area except for the CRGNSA, the following 9 National Forests (NFs) and 3 BLM Resource Areas (RAs), respectively: Okanogan, Wenatchee, Deschutes, Winema, Klamath, Lassen, Modoc, Shasta-Trinity and Mendocino NFs; and the Ukiah, Klamath Falls and Redding RAs. Two of these NFs, the Mendocino and Wenatchee, contain small NF areas located outside the NWFP boundary that will be assessed and included in this consultation. The FS non-NWFP areas included in this assessment are the Lake Red Bluff Recreation site on the Mendocino NF and approximately 25,000 acres of the Wenatchee NF. Additionally, the tribal lands of the Coquille Forest in Oregon will be included in this BA.

Species or Critical Habitat

There are 38 fish species or critical habitats being considered in this BA (Table 1). The 38 species or critical habitats consist of 26 listed species (4 endangered and 22 threatened), 4 anadromous fish ESU candidates for ESA listing, and 8 critical habitats (6 designated and 2 proposed). The majority of species and critical habitats are for anadromous fish ESUs, and therefore under the jurisdiction of NOAAF. The 33 species or critical habitats under NOAAF jurisdiction consist of 23 listed ESUs (4 endangered and 19 threatened), 4 anadromous fish ESU candidates for ESA listing, and 6 designated critical habitats for anadromous fish ESUs. The FWS jurisdiction applies to inland fish species that includes 3 bull trout DPSs and 2 proposed critical habitats for bull trout DPSs. The listing status of the species or critical habitats are provided by identifying the Federal Register notice and dates (Table 1).

Species/Critical Habitat Affected by Individual Administrative Units

Although there are 38 fish species or critical habitats being considered in this BA, the number of species and/or critical habitats affected by individual RMPs differs by administrative unit (Table 2). The individual plans require consultation for listed fish species (ESUs or DPSs) and

Table 1. The Evolutionarily Significant Units (ESU), Distinct Population Segments (DPS), designated or proposed critical habitat, and candidate ESUs considered in this BA.

Species	ESU, DPS, or Critical Habitat	Species Acronym	ESA Status	Federal Register Notice and Date
Chinook Salmon	California Coastal	CCC	Threatened	64 FR 50394 9/16/99
	Central Valley spring-run	CVSC	Threatened	64 FR 50394 9/16/99
	Sacramento River winter-run	SRWC	Endangered	59 FR 440 1-4-94
	Snake River Spring/Summer-run	SRSSC	Threatened	57 FR 14653 4/22/92
	Snake River Fall-run	SRFC	Threatened	57 FR 14653 4/22/92
	Upper Columbia River spring-run	UCRSC	Endangered	64 FR 14308 3/24/99
	Upper Willamette River	UWRC	Threatened	64 FR 14308 3/24/99
	Lower Columbia River	LCRC	Threatened	64 FR 14308 3/24/99
	Puget Sound	PSC	Threatened	64 FR 14308 3/24/99
	Central Valley fall and late fall-run	CVFC	Candidate	64 FR 50394 9-16-99
	Critical habitat for Sacramento River winter-run chinook salmon ESU	SRWC	Designated	58 FR 46944 9/3/93
	Critical habitat for Snake River Spring/Summer chinook salmon ESU	SRSSC	Designated	58 FR 68543 12/28/93
	Critical habitat for Snake River Fall chinook salmon ESU	SRFC	Designated	58 FR 68543 12/28/93
Coho Salmon	Puget Sound/Strait of Georgia	PSSGC	Candidate	60 FR 38011 7/25/95
	Lower Columbia River/Southwest Washington	LCRSWC	Candidate	60 FR 38011 7/25/95
	Central California Coast	CCCC	Threatened	61 FR 56138 10/31/96
	Oregon Coast	OCC	Threatened	63 FR 42587 8/10/98
	Southern Oregon/ Northern California Coast	SONCCC	Threatened	62 FR 24588 5/6/97
	Critical habitat for Central California Coast coho salmon ESU	CCCC	Designated	64 FR 24049 5/5/99
	Critical habitat for Southern Oregon/ Northern California Coast Coho ESU	SONCCC	Designated	64 FR 24049 5/5/99

Table 1 continued

Species	ESU, DPS, or Critical Habitat	Species Acronym	ESA Status	Federal Register Notice and Date
Chum Salmon	Hood Canal summer-run	HCSC	Threatened	64 FR 14508 3/25/99
	Columbia River	CRC	Threatened	64 FR 14508 3/25/99
Sockeye Salmon	Snake River sockeye	SRS	Endangered	56 FR 58619 11/20/91
	Critical habitat for Snake River sockeye salmon ESU	SRS	Designated	58 FR 68543 12/28/93
Steelhead	Upper Columbia River	UCRS	Endangered	62 FR 43937 8/18/97
	Lower Columbia River	LCRS	Threatened	63 FR 13347 3/19/98
	Snake River Basin	SRBS	Threatened	62 FR 43937 8/18/97
	Oregon Coast	OCS	Candidate	63 FR 13347 3/19/98
	Middle Columbia River	MCRS	Threatened	64 FR 14517 3/25/99
	Upper Willamette River	UWRS	Threatened	64 FR 14517 3/25/99
	Northern California	NCS	Threatened	65 FR 36074 6/7/2000
	Central California Coast	CCCS	Threatened	62 FR 43937 9/18/97
	Central Valley	CVS	Threatened	63 FR 13347 3/19/98
Bull Trout	Coastal-Puget Sound	CPSBT	Threatened	64 FR 58909 11/1/99
	Columbia River	CRBT	Threatened	63 FR 31647 6/10/98
	Klamath River	KRBT	Threatened	63 FR 31647 6/10/98
	Critical Habitat for Klamath River bull trout DPS	KRBT	Proposed	67 FR 71236 11/29/02
	Critical Habitat for Columbia River bull trout DPS	CRBT	Proposed	67 FR 71236 11/29/02

Table 2. Species and critical habitat affected by FS and BLM administrative units in NWFP. The acronyms for the species are listed in Table 1.

Administrative Unit	Listed Species	Designated Critical Habitat	Proposed Critical Habitat	Candidate Species
Columbia River Gorge NSA	LCRC, LCRS, CRC, CRBT, SRBS, SRS, SRSSC, SRFC	SRSSC, SRFC, SRS	CRBT	LCRSWC
Deschutes	CRBT		CRBT	
Gifford Pinchot	LCRC, LCRS, PSC, MCRS, CRBT, CPSBT		CRBT	LCRSWC, PSSGC
Klamath	SONCCC	SONCCC		
Lassen				
Mendocino	SONCCC, SRWC, CVSC, CCC, NCS, CVS	SONCCC, SRWC		CVFC
Modoc				
Mount Baker Snoqualmie	PSC, CPSBT			PSSGC
Mount Hood	LCRC, LCRS, MCRS, CRBT, UWRC		CRBT	LCRSWC
Okanogan	UCRSC, UCRS, CRBT		CRBT	
Olympic	PSC, CPSBT, HCSC			PSSGC, LCRSWC
Rogue River	SONCCC	SONCCC		
Six Rivers	SONCCC, CCC, NCS	SONCCC		
Siskiyou	SONCCC, OCC	SONCCC		OCS
Shasta-Trinity	SONCCC, CVSC, CVS	SONCCC		CVFC
Siuslaw	OCC			OCS
Umpqua	OCC			OCS
Wenatchee	UCRSC, UCRS, CRBT, MCRS		CRBT	
Willamette	UWRC, UWRS, CRBT		CRBT	
Winema	KRBT		KRBT	
Arcata	SONCC, CCC, NCS, CCCS	SONCCC		
Coos Bay	SONCC, OCC	SONCCC		OCS
Eugene	CRBT, UWRS, UWRC, OCC		CRBT	OCS
King Range NCA	SONCC, CCC, NCS, CCCS	SONCCC		
Klamath Falls	KRBT			
Medford	SONCCC, OCC	SONCCC		OCS
Redding	SONCCC, CVWC, CVSC			CVFC
Roseburg	OCC			OCS
Salem	LCRS, UWRS, UWRC, CRC, OCC, LCRC			LCRSWC, OCS
Ukiah	CCC, CCCC, NCS	CCCC		

designated critical habitat whereas the proposed critical habitat and candidate species (ESUs) require formal and informal conferencing, respectively. Table 2 displays the species and critical habitats affected by each FS or BLM RMP. The NWFP portions of the Lassen and Modoc NFs do not contain habitat for anadromous fish species because passage into the upper Sacramento River basin is blocked by Shasta dam and passage into the Klamath River basin is blocked by Iron Gate dam.

ENVIRONMENTAL BASELINE

The environmental baseline for this consultation includes descriptions of how the BLM and FS have been implementing the NWFP and the components of the ACS. The consultation history is described in section 3.1. Implementation of the RMPs is described in Section 3.2. Updates to categories of activities and analyses reflecting RMP and ACS implementation since the time of previous consultations are presented in this section. Environmental factors affecting the baseline are discussed in section 3.3.

Consultation History

Since the signing of the ROD for the NWFP in 1994 (USDA and USDI 1994b), the potential effects of the continued implementation of individual FS and BLM RMPs except the Modoc and Lassen NFs have been assessed and analyzed, individually or in a batch, for at least one or more of the ESA listed fish species, proposed fish species, candidate fish species or critical habitat considered in this assessment. In Northwest California, BAs were completed in 1995 for 4 NFs and 3 BLM resource area RMPs including the King Range National Conservation Area (KRNCA). Additionally, two NFs in California were determined to have no effect on any of the listed anadromous fish ESUs. In Oregon and Washington, 2 BAs were completed for the FS and BLM RMPs during 1997. An addendum to one Oregon and Washington BA was prepared in 1999. Consultation with NMFS was not concluded for the RMPs affecting the listed anadromous fish in the 1999 BA addendum. Based on the individual or batched BAs prepared for the FS and BLM RMPs in the NWFP area except for the 1999 BA addendum, numerous consultations and/or conferences with the NOAAF or FWS were concluded.

Ten consultations and/or conferences with the NOAAF or FWS were concluded on 28 RMPs during the 1997-2001 time periods (Table 3 and 4). Many of the NOAAF BOs listed in Table 3 were initially conference opinions (COs) that were eventually converted to BOs after a listing of an anadromous fish ESU. Descriptions of the general environmental baseline conditions in watersheds within the ESUs, DPSs, and designated or proposed critical habitat are described in prior RMP-level ESA consultation or conference records for the BOs and COs displayed in Tables 3 and 4, and are hereby incorporated by reference (USDA 1995b, 1995c, 1995d, 1995e, 2000; USDA and USDI 1997a, 1997b, 1998, 1999, USDC 1996a, 1996b, 1997b, 1997c, 1997d, 1998a, 1998c, 1998d, 1999, 2000b, 2000c, 2001; USDI 1997b, 1998, 2000a, 2000b, 2000c). Two conference opinions, one by each consulting agency, are still viable for the RMPs affecting the Oregon Coast steelhead ESU (USDC 1997b) and the proposed critical habitat for the Lost River and shortnose suckers (USDI 2000a) (Table 4).

Table 3. Previous Plan-Level BOs issued by NOAAF or USFWS addressing listed fish ESUs, DPSs and/or critical habitat (proposed or designated) for Administrative Units within the NWFP area. Highlighted rows pertain to Northwest Forest Plan area. The acronyms for the species are listed in Table 1.

BO Date/ Consulting Agency	ESU/DPS	Aquatic Conservation Strategy	National Forests/ National Scenic Area (NSA)	BLM District, Resource Area or National Conservation Area (NCA)
March 18, 1997 NOAAF	Umpqua River cutthroat trout ESU	Northwest Forest Plan	Siskiyou, Umpqua and Siuslaw	Coos Bay, Roseburg, and Eugene
June 20, 1997 NOAAF	CCCC; SONCCC	Northwest Forest Plan	Klamath, Shasta-Trinity, Mendocino, Six Rivers	Arcata, Redding, Ukiah, King Range NCA
July 9, 1997 NOAAF	SONCCC	Northwest Forest Plan	Rogue River, Siskiyou, Umpqua and Winema	Coos Bay and Medford
March 19, 1998 NOAAF	LCRS	Northwest Forest Plan	Gifford Pinchot Mt. Hood Columbia River Gorge NSA	Salem
June 4, 1998 NOAAF	CVS	PACFISH	Lassen	None
June 19, 1998 NOAAF (incorporates by reference the March 1, 1995 BO)	UCRS	Northwest Forest Plan and PACFISH	Okanogan Wenatchee	None
August 14, 1998 USFWS	CRBT; KRBT	PACFISH and INFISH	Deschutes, Okanogan, Wenatchee, Winema and Columbia River Gorge NSA	None
September 29, 1998 NOAAF	OCC	Northwest Forest Plan	Siskiyou Umpqua Siuslaw	Medford, Coos Bay, Eugene, Salem and Roseburg
August 6, 1999 NOAAF	Critical Habitat for SONCCC	Northwest Forest Plan	Rogue River Siskiyou Umpqua Winema	Coos Bay Medford
October 29, 2000 NOAAF	CVSC	PACFISH	Lassen	None
March 24, 2000 USFWS	shortnose sucker; Lost River sucker	INFISH	Winema	None

Table 3 continued

BO Date/ Consulting Agency	ESU/DPS	Aquatic Conservation Strategy	National Forests/ National Scenic Area (NSA)	BLM District or Resource Area
May 25, 2000 USFWS	CPSBT; CRBT; KRBT	Northwest Forest Plan	Deschutes; Gifford Pinchot; Mt. Baker/Snoqualmie; Mt. Hood; Okanogan; Olympic; Wenatchee; Willamette; Winema and Columbia River Gorge NSA	Eugene
December 22, 2000 NOAAF	CVS; CVSC	Sierra Nevada Forest Plan Amendment	Lassen	None
April 16, 2001 NOAAF	NCS; CCCS; CVS; CCC; CVSC; Critical Habitat for SONCCC; Critical Habitat for CCCC	Northwest Forest Plan	Klamath, Shasta-Trinity, Mendocino, Six Rivers	Arcata, Redding, Ukiah, King Range NCA

Table 4. Previous Plan-Level Conference Opinions (CO) issued by NOAAF or USFWS addressing candidate anadromous fish ESUs or proposed critical habitat for Administrative Units within the NWFP area.

CO Date/ Consulting Agency	ESU/DPS	Aquatic Conservation Strategy	National Forests	BLM District or Resource Area
March 18, 1997 NOAAF	Oregon Coast steelhead ESU	Northwest Forest Plan	Siskiyou, Umpqua and Siuslaw	Medford Coos Bay Eugene Salem Roseburg
March 24, 2000 USFWS	Proposed critical habitat for Lost River and shortnose suckers	Northwest Forest Plan and INFISH	Winema	None

There have been no significant changes to the RMPs since the dates of the Plan-level BOs and COs. This BA considered any amendments to the RMPs that have occurred since the last consultation on the RMPs. The Willamette, Olympic and Mt. Baker Snoqualmie NFs have not undergone an ESA consultation with NOAAF on their RMPs, therefore, any amendment affecting listed species was reviewed. Of the 30 administrative units in the NWFP area, 3 administrative units identified amendments to their RMPs that may affect the listed fish or critical habitat considered in this BA. The Deschutes, Mt. Baker Snoqualmie and Wenatchee National Forests each reported an amendment affecting listed species. Consultation, informal or

formal, was concluded with the appropriate consulting agency on all 3 of these amendments. Therefore, the FS and BLM believe the RMPs have not materially changed since the issuance of the Plan-level BOs and COs.

In 1993, the BA for alternative 9 (the selected alternative) of the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old Growth Forest related Species within the Range of the Northern Spotted Owl (USDA et al 1994a) determined the listed Sacramento River winter chinook salmon ESU as well as the 3 listed Snake River salmon ESUs would not be affected by the NWFP ACS. The 3 listed species or ESUs of the Snake River Basin are: Snake River fall chinook salmon; Snake River spring/summer chinook salmon; and Snake River sockeye salmon. The NOAAF concurred with the BA's no adverse affect determination for the 4 anadromous fish species ESUs listed as threatened or endangered within the range of the northern spotted owl. NOAAF stated that the species were not affected by Federal land management activities within the range of the northern spotted owl. Although the initial assessment of the NWFP ACS concluded no effect to the Snake River ESUs, the subsequent designation of the entire Columbia River as critical habitat for these species triggered a reassessment of those conclusions in this BA since one administrative unit governed by the NWFP ACS contains critical habitat. Also, the Sacramento River winter chinook ESU is being addressed herein because of a recreational area located outside the boundary of the NWFP. However, the NWFP portion of the FS and BLM administrative units within the Sacramento River Basin still do not affect the Sacramento River winter chinook salmon ESU.

The NWFP ROD provides an ACS for only a portion of the range of 2 bull trout DPSs and several anadromous fish ESUs. PACFISH and INFISH are also aquatic conservation strategies designed to minimize adverse effects to anadromous or inland native fish habitat, respectively. In 1995, the Deschutes, Okanogan and Winema NFs were amended by the INFISH aquatic conservation strategy, and the CRGNSA, Lassen and Okanogan NFs were amended by the PACFISH aquatic conservation strategy. Four consultations with NOAAF or FWS regarding these RMPs as amended by INFISH or/and PACFISH are identified in Table 3. Additionally, the interim PACFISH aquatic conservation strategy for the Lassen NF was replaced with a long-term conservation strategy for which consultation with NOAAF was completed in December, 2000 (Table 3).

Implementation of the RMPs

The record of decision (ROD), selecting the alternative 9, was effective on May 20, 1994 and amended all 29 FS and BLM RMPs except the CRGNSA plan within the range of the northern spotted owl (USDA and USDI 1994b). Implementation of the RMPs as amended by the ACS of the NWFP since 1994 is documented in FS and BLM monitoring and accomplishment reports of land and resource management. The results of these reports are discussed in the following sections: 3.21 Implementation monitoring, 3.22 Restoration accomplishments, 3.23 Watershed analyses, 3.24 Road system network, 3.25 Timber harvest and 3.26 Effectiveness Monitoring.

Implementation Monitoring

A regional-scale Northwest Forest Plan implementation monitoring (NFPIM) program has been in place since 1996. The purpose of the field monitoring program is to determine whether the Record of Decision (ROD) for the Plan and its corresponding S&Gs are being consistently followed across the range of the Plan. This program is conducted under the direction of the Regional Interagency Executive Committee (RIEC).

The method used to determine if activities are compliant with the NWFP S&Gs is to monitor randomly selected projects using a neutral assessment tool (questionnaire) administered by a jury or group leveling process (e.g. 12 Provincial teams which include members of the Provincial Advisory Committees). Provincial reports are submitted to a Regional team that summarizes the results into a regional report.

Since its inception in 1996 through 2001, 138 timber sales, 63 watershed analyses, 24 road projects, 18 restoration projects, 4 fuel reduction projects, and several other individual activities have been monitored. To date, there has been greater than 95% compliance with meeting the S&Gs for the monitored activities.

A summary of implementation monitoring findings from each report from 1996 to 2001 follows (Regional Implementation Monitoring Team 1997, 1998, 1999, 2000a, 2000b, 2002a, 2002b).

1996 Report

In FY 1996 the NFPIM Program addressed 42 timber sales. Results showed a high level of compliance (95 percent) with ROD S&Gs for the 42 timber sales (Table 5).

Table 5. Compliance of FY 1995 Timber Sales with S&Gs

Responses[1]	Count	Overall Percentage (%)	Applicable Percentage (%)
Meets	889	12.67	95.18
Fails to Meet	39	0.56	4.18
Fails, Not Capable of Meeting	6	0.09	0.64
Not Applicable	6,068	86.51	-
Blank (no response)	12	0.17	-
TOTAL	7,014	100.00	100.00

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. Questions answered as "Yes" by the Provincial Monitoring Teams were considered to indicate compliance with S&Gs; the "No" questions were categorized as not indicating compliance. The overall percentage is based upon all responses - 7,014. The applicable percentage is based upon

only those 934 responses for which an S&G did apply (the sum of all "meets" and "fails" responses).

1997 Report

In FY 1997 the NFPIM Program addressed 40 timber sales, 17 roads, and 16 restoration projects. Tables 6, 7 and 8 present the results of the 1997 report. For the second consecutive year, results of the Regional NFPIM Program showed a high level of compliance with ROD S&Gs for timber sales (95 percent), roads (99 percent), and restoration projects (98 percent).

Table 6. Compliance of FY 1996 Timber Sales with S&Gs

Responses[1]	Count	**Overall Percentage (%)**	**Applicable Percentage (%)**	**Adjusted Percentage (%)**
Exceeded	34	0.7	3.2	3.6
Met	957	19.0	91.0	91.6
Not Met	41	0.8	3.9	2.5
Not Capable	19	0.4	1.8	2.3
Not Applicable	3,980	79.1	---	---
Blank (no response)	0	0.0	---	---
TOTAL	5,031	100.0	100.0	100.0

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. The overall percentage is based upon all responses - 5,031. The applicable percentage is based upon only those 1,051 responses for which an S&G did apply (the sum of all "Meets" and "Fails" responses). The adjusted percentage uses weighted values to estimate the "region-wide" percentages that take into account the stratified selection process.

Table 7. Compliance of Roads with S&Gs

Responses[1]	Count	Overall Percentage (%)	Applicable Percentage (%)
Exceeded	4	0.3	1.0
Met	431	29.1	97.7
Not Met	6	0.4	1.4
Not Capable	0	0.0	0.0
Not Applicable	1,038	70.2	--
Blank (No Response)	0	0.0	--
TOTAL	1,479	100.0	100.0

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. The overall percentage is based upon all responses - 1,479 The applicable percentage is based upon only those 441 responses for which an S&G did apply (the sum of all "applicable" responses).

Table 8. Compliance of Restoration Projects with S&Gs

Responses[1]	Count	Overall Percentage (%)	Applicable Percentage (%)
Exceeded	7	0.5	2.1
Met	312	19.9	95.4
Not Met	6	0.4	1.9
Not Capable	2	0.1	0.6
Not Applicable	1,241	79.1	--
Blank (No Response)	0	0.0	--
TOTAL	1,568	100.0	100.0

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. The overall percentage is based upon all 1,568 responses. The applicable percentage is based upon only those 327 responses for which an S&G did apply (the sum of all "applicable" responses).

1998 Report

The FY 1998 NFPIM Program reviewed 24 randomly selected timber sales and associated new road construction. The results of the FY 1998 review of timber sales are found in Table 9. There was a high level of compliance with S&Gs for timber sales (96 percent for FY 1998).

Table 9 presents both the sample and the regional estimates. The regional estimates were calculated by applying the appropriate strata weights to the individual timber sale results. As in FYs 1996 and 1997, the FY 1998 program indicates a high overall level of compliance with NWFP S&Gs (96.7 percent the sum of exceeded, met, and not capable in Table 9).

Table 9. Compliance of Timber Sales with S&Gs

Responses[1]	Count	**Overall Sample Percentage (%)**	**Applicable Sample Percentage (%)**	Regional **Percentage (%)**
Exceeded	30	1.1	3.4	3.3
Met	803	29.6	90.9	92.2
Not Met	35	1.3	4.0	3.3
Not Capable	15	0.6	1.7	1.2
Not Applicable	1,829	67.4	---	---
Blank (no response)	0	0	---	---
TOTAL	2,712	100.0	100.0	100.0

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. The overall percentage is based upon all 2,712 responses. The applicable percentage is based upon only those 883 responses for which an S&G did apply (the sum of all "applicable" responses). The regional percentage is computed based on the sample results weighted by the number of timber sales in each stratum.

1999 Report

The FY 1999 NFPIM Program reviewed 24 randomly selected timber sales and 12 watersheds. The results of the FY 1999 review of timber sales are found in Table 10. For the fourth consecutive year, results of the program show high levels of compliance with S&Gs for timber sales (97.9 percent for FY 1999).

Table 10. **Compliance of Timber Sales with S&G**s

Responses [1]	Count	Overall Percentage (%)	Applicable Percentage (%)
Exceeded	17	0.8	2.5
Met	621	28.8	92.1
Not Met	14	0.6	2.1
Not Capable	22	1.0	3.3
Not Applicable	1,486	68.8	-
Total	2,160	100.0	100.0

[1] Responses were categorized as to whether or not they were consistent with the S&Gs. The overall percentage is based upon all 2,160 responses. The applicable percentage is based upon only those 674 responses for which an S&G did apply (the sum of all "applicable" responses).

Key Watersheds

There were seven key watersheds reviewed. Six of the watersheds reviewed had avoided road construction. Six watersheds had reduced and one had maintained road net amount. All seven watersheds had decommissioned roads posing the highest risks to riparian and aquatic systems. The remainder of the units reported these questions were not applicable to their watersheds.

Of the 1861.2 system road miles existing in 1994, 365.5 (approximately 20%) have been decommissioned and/or improved and 13.3 (.7%) new miles have been added to BLM and FS lands in these watersheds. Of the 127 non-system road miles existing in these watersheds in 1994, almost 12 miles (approximately 9%) have been decommissioned and/ or improved, and almost 11 miles are new (8.6%). Table 11 shows the road mileage from 1994 to 1999 in Key Watersheds.

Table 11. Road Mileage from 1994 to 1999 in Key Watersheds

Agency	System Road Mileage				Non-system and Temporary Road Mileage				Net since 1994
	Existing in 1994	New since 1994	Decom[1] since 1994	Improved/ Restored since 1994	Existing in 1994	New since 1994	Decom[1] since 1994	Improved/ Restored since 1994	
FS	1812.2	13.3	84	274	97	10.9	11.6	0	- 71.4
BLM	49	0	0	7.5	30	0	0.25	0	- 0.25

[1]Miles of decommissioned or obliterated roads

Watershed Analyses and Riparian Reserves

All units, except one, had completed their Watershed Analyses (WA). The one exception had completed a Watershed Assessment instead of an analysis because of minimal federal ownership. Four units had planned to update their WA by FY 2002 and the remaining units did not identify a schedule for updating.

Five of twelve watersheds had adjusted interim Riparian Reserve (RR) boundaries and the remaining units did not adjust the boundaries because interim boundaries were found to be adequate or no actions were undertaken requiring adjustment. Of the five watersheds that had changed their RR widths, each had completed a National Environmental Policy Act (NEPA) document for the changes, mostly based on the WA.

All units had identified restoration opportunities in their watersheds. Four watersheds reported that the priority for upgrading stream crossings had been based on risk to ecological value; seven watersheds said some; and one responded none.

All units reported taking management actions that have contributed to watershed restoration and ACS objectives. The most prevalent were road closures, culvert replacements, and riparian plantings. Seven of the watersheds reviewed reported that all habitat restoration activities had contributed to ACS objectives; four watersheds said some; and one said not applicable. Responses for eight watersheds indicated that watershed restoration projects had been designed to protect long-term ecological integrity, conserve genetic integrity of native species and contribute to attainment of ACSOs; for three watersheds the response was some; and for one the response was not applicable because no activities had been initiated in the watershed.

2000 Report

Two watersheds were selected for each of twelve provinces in the Northwest Forest Plan area. Program results showed:

- Watershed analyses were completed for 21 of 24 watersheds and two were in progress
    - None of the watershed analyses had been updated
- Widths of Riparian Reserves were changed in two of 24 watersheds
    - In one watershed widths were increased and modified (not specified whether wider or narrower) in another
    - Widths were modified at the project level and not at the watershed scale
    - Changes were evaluated and documented in timber sale NEPA documents
- Miles of system roads were reduced 4% (82.2 miles) for 13 Key Watersheds
- Non-system roads were reduced 5.9% (11.3 miles) for six Key Watersheds
- Road management or transportation plans had not been prepared for roads specifically in Riparian Reserves
- Assessments were completed for 19 of 22 watersheds containing Late Successional Reserves (LSRs)
    - Assessments were ongoing in two of the three watersheds containing LSRs
- Many projects were designed with specific LSR objectives, but some were designed only to meet guidelines
- The hierarchy of land allocations were applied as directed in the ROD
- Fourteen of fifteen watersheds sampled that contained Matrix land allocations met the S&G requiring retention of old-growth fragments in watersheds where little remains
    - Wildfire destroyed all except 9% of late-successional habitat in the other
- A high degree of variation was found in how the field units perceived and used the WA process to:
    - Report site-specific Aquatic Strategy compliance of project, activities, and programs before and after the ROD
    - Provide adequate information for the decision-maker to determine if proposed and certain existing projects, activities, and programs are consistent with ACS objectives
    - Provide enough information for recreation projects, programs, or facilities planned, implemented or both since 1994 for the decision-maker to determine that the project or management action meets or does not prevent attaining Aquatic Strategy objectives
    - Provide evaluation and mitigation for existing recreation facilities and roads in Riparian Reserves, if any, to ensure they do not prevent and, to the extent practicable, contribute to attaining Aquatic Strategy objectives

2001 Report

In 2001, the portion of the NFPIM program conducted at the field level was designed to sample 24 randomly selected 5th field watersheds (two per province) and 24 specific projects (one per

randomly selected watershed) (Baker 2002). Three project and watershed reviews in eastern Washington were canceled because of the extreme fire situation.

The 2001 monitoring results:

- Watershed analyses were completed for 18 of 21 5th field watersheds
  - Three analyses had been updated
- Riparian reserve widths had not been modified since 1994 in any watershed
- Road mileages were reduced 11 percent and 6.9 percent in Key Watersheds (12) and 5th field watersheds (15), respectively
- Project reviews resulted in 98% overall compliance with S&Gs
  - Percent compliance of the 21 projects ranged from 91 to 100 with 13 projects being 100 percent compliant
  - Adverse biological effects associated with instances of noncompliance appeared to be minimal at the regional scale. Where noncompliance occurred, the local effects were judged to be generally low to moderate.

Table 12. Road Mileage From 1994 to 2001 in Key Watersheds

Activity	# of Watersheds	Total Miles
1994 System Roads	12	1,752.8
New Roads	2	2.2
Decommissioned	11	197.7
Improved or Restored	6	39.3
2001 System Roads	12	1557.4

Restoration

Restoration is one of the primary components of the NWFP ACS. Restoration accomplishments by the FS and BLM administrative units are summarized for various time periods in Table 13. In contrast, the accomplishments presented in Tables 11 and 12 for road decommissioning are only for the specific watersheds reviewed by the regional implementation monitoring program in 1999 and 2001. The restoration accomplishments for the Oregon and Washington administrative units are displayed for a four year period, 1998-2001; whereas, the California administrative units, the Klamath, Mendocino, Six Rivers, Shasta-Trinity, Arcata, Redding and Ukiah NFs, display accomplishments for an eight year period, 1994-2001 (Table 13). The 1994-1997 restoration accomplishments for the Oregon and Washington administrative units were included in previous RMP consultations (Table 3) or are displayed in the 1999 addendum (USDA and USDI 1999) to the 1997 BA (USDA and USDI 1997a). It should be noted that the restoration accomplishments for the King Range National Conservation Area are included with the Arcata administrative unit. Data was not collected for the Modoc and Lassen NFs since the listed species or critical habitat addressed in this BA are not affected by those Forests RMPs.

Table 13 Summary of aquatic restoration accomplishments by FS and BLM administrative units during a four year period, 1998-2001, except for Klamath, Mendocino, Six Rivers, Shasta-Trinity, Arcata, Redding and Ukiah units that display accomplishments for an eight year period, 1994-2001. The values for Arcata administrative unit include the King Range National Conservation Area. The acronym "ND" means no data available.

Administrative Unit	*Instream Structures (mi.)*	*Instream Passage (mi.)*	*Riparian (ac.)*	*Riparian (mi.)*	*Upland (ac.)*	*Decommissioned Roads (mi)*	*Road Improved (mi.)*	*Wetland Fresh (ac.)*
Columbia River Gorge NSA	3	0	375	0	0	6	3	137
Deschutes	26.3	0.7	513	30.5	529	104.3	15.4	207
Gifford Pinchot	178.3	1.1	1508	21.7	11	285.8	193.3	0
Klamath	325	ND	ND	ND	2907	136.2	ND	ND
Lassen	ND	ND	ND	ND	ND	ND	ND	ND
Mendocino	67	ND	ND	ND	567	62	ND	ND
Modoc	ND	ND	ND	ND	ND	ND	ND	ND
Mount Baker Snoqualmie	8.4	0.5	13	0	1	54.4	137.6	0
Mount Hood	50.3	24.1	176	13.3	309	42.4	16.1	4
Okanogan	0.6	0.2	15	1.3	47	24.2	19.2	0
Olympic	0.8	4.3	82	9.9	368	46.7	33.9	0
Rogue River	44.5	55	628	0	99	26.5	12.9	1
Six Rivers	120	ND	ND	ND	711	137	ND	ND
Siskiyou	62.8	39	2833	0	0	57.7	0	0
Shasta-Trinity	244	ND	ND	ND	1980	112.4	ND	ND
Siuslaw	40.2	0	70	1.9	0	34.4	10.6	0
Umpqua	12.3	3	11	2.3	4099	85.6	110	0
Wenatchee	8.3	27	337	63.6	4	91.9	92.2	18
Willamette	18	0	613	38.7	1784	43.4	65.1	7
Winema	0.3	0	0	0	1	150.1	0.2	0
Arcata	ND	ND	ND	ND	ND	33.5	ND	ND
Coos Bay	12.2	25.1	1533	0.3	0	28.8	2.1	0
Eugene	7.7	8.2	11	3.1	0	5.3	0.9	0

Table 13 continued

Administrative Unit	*Instream Structures (mi.)*	*Instream Passage (mi.)*	*Riparian (ac.)*	*Riparian (mi.)*	*Upland (ac.)*	*Decommissioned Roads (mi)*	*Road Improved (mi.)*	*Wetland Fresh (ac.)*
Klamath Falls	0	0	273	1.5	738	0.3	1.4	3
Medford	5.3	147.3	463	6.3	4	37.6	173.2	0
Redding	ND	ND	ND	ND	ND	21.9	ND	ND
Roseburg	4.3	33.8	11	0	0	14	62.2	0
Salem	12.1	9.5	1606	8	12	127.8	52	0
Ukiah	0.5	0	0.5	0.8	0	0	0	0
Totals	**1252.2**	**378.8**	**11071.5**	**203.2**	**14171**	**1770.2**	**1001.3**	**377**

Definitions:
Instream Structure: Miles of stream treated to the nearest tenth of a mile. Includes actions designed to change or modify stream complexity and structure, including but not limited to placement of large woody debris, construction of weirs/deflectors, creation of pools, placement of boulders, rock gabions, gravel placement, development or improvement of side channels, alcoves, or other actions designed to improve stream structure.

Instream Passage: Miles of stream accessed to the nearest tenth of a mile. Includes actions designed to protect and improve fish passage for juvenile or adult fish including but not limited to: culvert removal, culvert upgrade, fish ladders improved or installed, irrigation diversions, fish screens.

Riparian acres: Acres treated to the nearest acre. Includes actions designed to improve, restore, or maintain quality and/or conditions of riparian zone vegetation; including but not limited to planting, fencing, off channel watering, beaver management, invasive plant control, livestock rotation or other management, stand conversion.

Riparian miles: Miles of stream within the treated area to the nearest tenth of a mile. Includes actions designed to improve, restore, or maintain quality and/or conditions of riparian zone vegetation; including but not limited to planting, fencing, off channel watering, beaver management, invasive plant control, livestock rotation or other management, stand conversion.

Upland: Acres treated to the nearest acre. Includes actions designed in upland areas to minimize risk to riparian/aquatic system health and functions; including but not limited to: slope stabilization/ revegetation, silvicultural treatments, livestock exclusion fencing.

Roads decommissioned: Miles of roads decommissioned to the nearest tenth of a mile. Includes actions designed to make roads hydrologically stable and self-maintaining. Actions may range from full obliteration to water barring along with culvert removal.

Roads improved: Miles treated to the nearest tenth of a mile. Includes actions/activities designed to reduce sediment and improve stability or to allow more natural functioning of stream and flood plain - including but not limited to drainage, upgrades, stabilization, and relocation.

Wetlands (Freshwater): Acres treated to the nearest acre. Activities designed to create, maintain, or restore freshwater wetland habitat.

Watershed Analysis

Watershed analysis (WA) is one of the primary components of the NWFP ACS. WA is required for Key Watersheds, roadless areas in Non-Key Watersheds and Riparian Reserves before initiating actions except for minor actions. Sixteen administrative units have completed watershed analyses for 90% or more of the federal land area covered by their RMPs including 7 units with 100% accomplishment (Table 14 and Figure 2). Watershed analyses have been completed for 80-89% and 50-79% of the RMP federal land area for 4 and 4 administrative units, respectively (Table 14). Three administrative units have completed WA for less than 50% of their unit area. WA accomplishment data was not compiled for the Modoc and Lassen NFs since the listed species or critical habitat addressed in this BA are not affected by those Forest RMPs. The WA accomplishments for the King Range National Conservation Area are included in the values for the Arcata administrative unit.

WA has been completed by the administrative units for the vast majority of Key Watersheds in the NWFP area. The CRGNSA and the Ukiah Resource Area are the only units that don't have any designated Key Watersheds. Watershed analyses has been completed for 100% of the Key Watersheds on 19 administrative units (Table 14 and Figure 3). Six administrative units have completed watershed analyses for 67-91% of their Key Watershed areas (Table 14). Small federal land ownership, lack of cooperators, and/or lack of project activity made these key watersheds a low priority for WA.

Watershed analyses have been completed for the vast majority of the inventoried roadless areas in the NWFP area. Inventoried roadless areas occur only on National Forest lands in the NWFP area. Watershed analyses has been completed for 100% of the inventoried roadless areas in non-Key Watersheds on 10 administrative units. Eight administrative units have not completed watershed analyses for inventoried roadless areas in non-Key Watersheds. Like Key Watersheds, WA is a low priority for many inventoried roadless areas in non-Key Watersheds due to small federal land ownership, lack of cooperators, land allocation designation, and/or lack of planned project activity. As mentioned above. data was not collected for the Modoc and Lassen NFs.

Table 14. Percentage of FS and BLM administrative units and key watershed area with completed watershed analyses.

Administrative Unit	Federal Land Area with Completed Watershed Analyses (%)	Key Watershed Area with Completed Watershed Analyses (%)
Columbia River Gorge National Scenic Area	83.3	Not Applicable
Deschutes	82.9	100
Gifford Pinchot	99.1	100
Klamath	71	86
Lassen	No Data	No Data
Mendocino	93.1	100
Modoc	No Data	No Data
Mount Baker Snoqualmie	66.2	71
Mount Hood	100	100
Okanogan	100	100
Olympic	80.4	91
Rogue River	100	100
Six Rivers	80.7	85
Siskiyou	99.9	100
Shasta-Trinity	56.4	100
Siuslaw	98	100
Umpqua	98.5	82
Wenatchee	100	100
Willamette	100	100
Winema	55.7	100
Arcata	33.5	67
Coos Bay	93.1	100
Eugene	96.1	100
Klamath Falls	100	100
Medford	93	100
Redding	43.6	100
Roseburg	100	100
Salem	97.1	100
Ukiah	37	Not Applicable

Figure 2. Histogram Displaying Percentage Classes of Land Area with Completed Watershed Analysis by Numbers of Forest Service and Bureau of Land Management Administrative Units in the Northwest Forest Plan Area

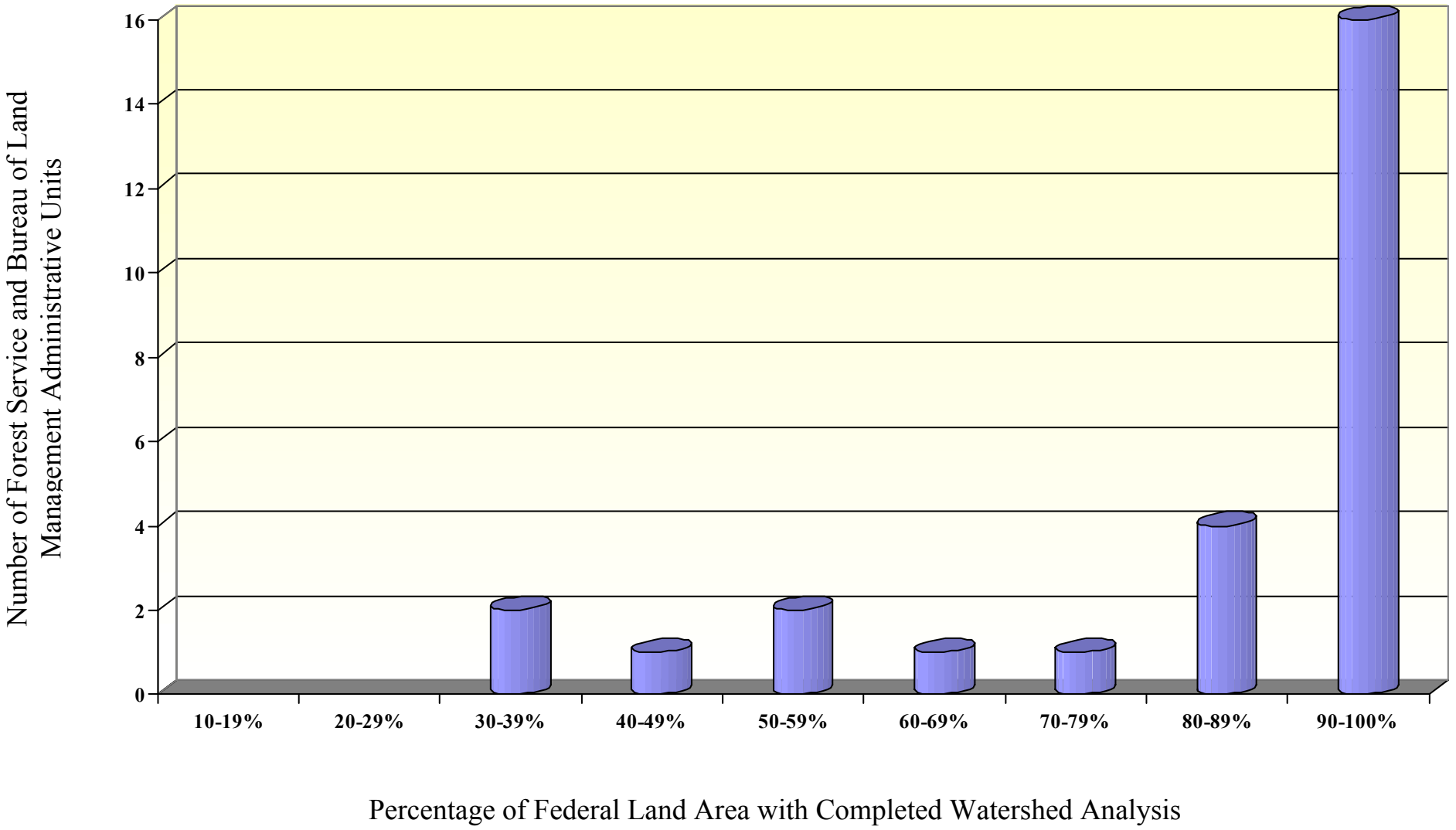
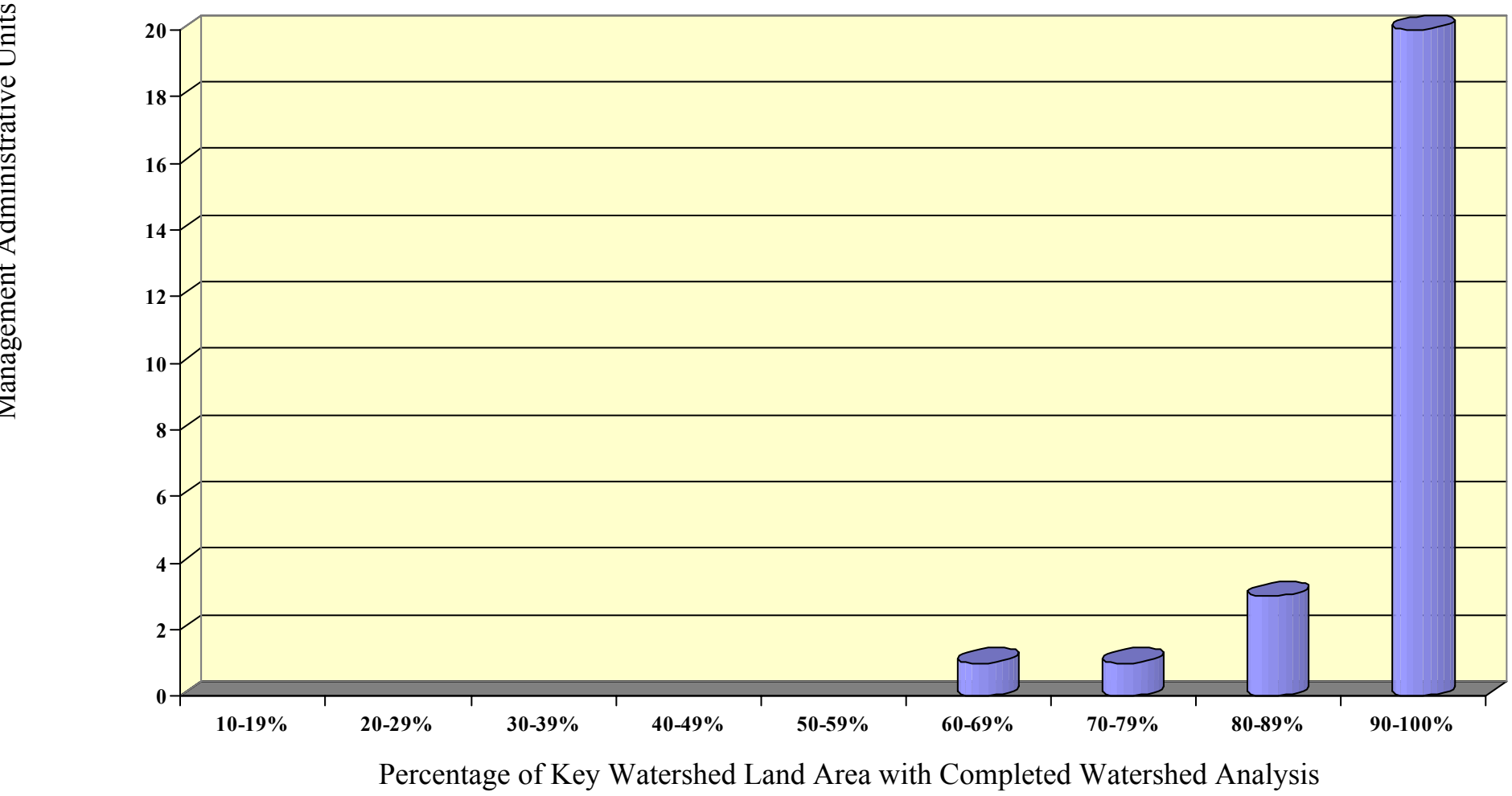


Figure 3. Histogram Displaying Percentage Classes of Key Watershed Land Area with Completed Watershed Analysis by Numbers of Forest Service and Bureau of Land Management Administrative Units in the Northwest Forest Plan Area



System Road Network

NOAAF and FWS have identified roads as one of the most pervasive management activities affecting listed fish species and habitat. The current system road mileage for the administrative units is listed in Table 15. The database for the FS system roads is tracked by NFs, therefore the databases for NFs with lands outside the NWFP area include system road mileage from these non-NWFP areas too. Of the 10 FS administrative units with non-NWFP area, the Deschutes, Okanagon, and Winema NFs are at least 28% or more Non-NWFP area. The CRGNSA, Wenatchee, Klamath, Mendocino, and Shasta Trinity administrative units are less than 5% Non-NWFP. The Modoc and Lassen NFs are primarily Non-NWFP areas. The BLM administrative units system road mileage is only NWFP area.

Implementation of the FS and BLM RMPs as amended by the NWFP has resulted in changes to system road mileage as displayed in Table 15. However, the availability of databases to display changes to the system road network varies by agency, State or Regional office, and individual administrative units. The BLM administrative units net changes to road mileage in Table 15 represent time period differences from year 2000 to 2003 except for the Arcata and Redding units which display changes from 1994 to 2003. It should be noted that the system road mileage for the King Range National Conservation Area is included with the Arcata administrative unit.

The time period used to display net changes to road mileage by administrative unit for the FS differ by region and administrative units. The Oregon and Washington administrative units display differences for a 10 year period, 1993-2002; whereas, the California administrative units vary for the most part by NF: the Klamath (1993-2002), Six Rivers (1994-2002), Mendocino and Shasta-Trinity (2000-2002). The CRGNSA road mileage was not tracked separately from the Mt. Hood and Gifford Pinchot NFs until recently, therefore net changes are not displayed. Data was not collected for the Modoc and Lassen NFs since the listed species or critical habitat addressed in this BA are not affected by those NFs.

Overall, the system road mileage has been reduced in the NWFP area since the adoption of the NWFP ACS. The net system road mileage has been reduced 4307 miles which represents a 4.7% reduction (Table 15). However, as noted above, the initial reference years are variable. The system road mileage was reduced on 17 administrative units and was increased on 9 units. Information on the net change to road mileage is not presented for 4 units but this is inconsequential since the units would have either no affect to the listed species (Lassen and Modoc) or have relatively small road networks (Ukiah and CRGNSA).

Nine administrative units display a net increase in system road mileage. The relatively large increases and reductions on the BLM administrative units are primarily a result of an effort to validate the management jurisdiction of road segments. The reasons for individual FS administrative unit increases to system road mileage are primarily a result of efforts to update the inventory of system roads but also are associated with land exchanges and/or acquisitions of private land for some administrative units.

Table 15. Status of system road mileage by administrative unit within the NWFP Area. Road miles represent the sum of all system road classes. The acronym ND represents no data. Negative values are displayed within the < > symbols.

Administrative Unit	System Road Network Changes		Current System Road Network (mi)
	Net Mileage	**Net Percentage**	
Columbia River Gorge NSA	ND	ND	138
Deschutes	<194>	<2.2>	8529
Gifford Pinchot	<205>	<4.7>	4114
Klamath	<730>	<14.9>	4177
Lassen	ND	ND	ND
Mendocino	27	1.1	2491
Modoc	ND	ND	ND
Mount Baker Snoqualmie	<343>	<11.4>	2654
Mount Hood	<339>	<8.7>	3566
Okanogan	38	1.4	2706
Olympic	<300>	<12.1>	2178
Rogue River	<268>	<9.5>	2547
Six Rivers	280	10.7	2903
Siskiyou	<186>	<6.3>	2765
Shasta-Trinity	104	1.6	6547
Siuslaw	<243>	<9.6>	2298
Umpqua	<73>	<1.5>	4806
Wenatchee	585	11.5	5652
Willamette	73	1.1	6491
Winema	61	1.0	6283
Arcata	<34>	ND	ND
Coos Bay	<872>	<29.2>	2114
Eugene	<705>	<24.4>	2182
Klamath Falls	<129>	<28.9>	319
Medford	<455>	<8.6>	4826
Redding	<22>	<8.4>	239
Roseburg	614	20.5	3615
Salem	<991>	<27.3>	2637
Ukiah	ND	ND	36
TOTAL	<4307>	<4.7>	86813

Corrections have been made to existing Forest Service roads that had incorrect mileages recorded in the database. A number of "ghost roads" that were previously uninventoried have entered into the Infra database. Also with such large databases on the NFs, errors are going to be uncovered and corrected from time to time.

Timber Harvest

The Northwest Forest Plan assumed that 90 percent of the early decades PSQ would come from late-successional and old growth forest, much of it through regeneration harvest. Individual RMPs outline assumptions for the amount and timing of silvicultural prescriptions such as thinning, partial cutting, and regeneration harvesting. The planning assumptions are based on the type of forests and the mix of older and younger forests available for harvest within each administrative unit. Achievement of Probable Sale Quantities for the individual administrative units, and for the Northwest Forest Plan area as a whole, are contingent on the ability to implement the full range of silvicultural prescriptions outlined in individual RMPs.

The Northwest Forest Plan established the term "Probable Sale Quantity" (PSQ) for estimates of average annual timber sale levels likely to be achieved. The Northwest Forest Plan FSEIS (Chapter 3&4, Page 267) addressed the potential for the PSQ to change as National Forest and BLM District plans were completed or revised:

> "Sustainable sale estimates will be made using more refined data and procedures available when Draft Forest and District Plans are completed or current plans are revised."

The Northwest Forest Plan FSEIS (Chapter 3&4, Pages 266 and 268) estimated the PSQ at 958 million board feet (MMBF), plus an additional 10 percent volume estimated in "other wood" (cull, sub-merchantable, firewood, and other products) for a total of 1.1 billion board feet. By 1998, PSQ across the Northwest Forest Plan area was reduced by 15 percent, to 811 MMBF. Revised Riparian Reserves acreage estimates at the local administrative unit level, was the single largest factor for the reductions in PSQ. It was determined that more of the landscape was in Riparian Reserves and therefore not available to contribute to the PSQ.

Since the adoption of the NWFP in 1994, the actual timber sale offerings have been less than the annual PSQ for each year. Since 1999, the agencies' offerings have ranged from 148 mmbf to 400 mmbf (Figure 4). The reduction in sale offerings is the result of appeals and protests on individual projects; enjoined BOs in the Pacific Coast Federation of Fisherman's Association v. National Marine Fisheries Service 71 F. Supp.2d 1063, 1069 (W.D. Wash. 1999) litigation; and, implementation of the Survey and Manage mitigation measures, among other reasons.

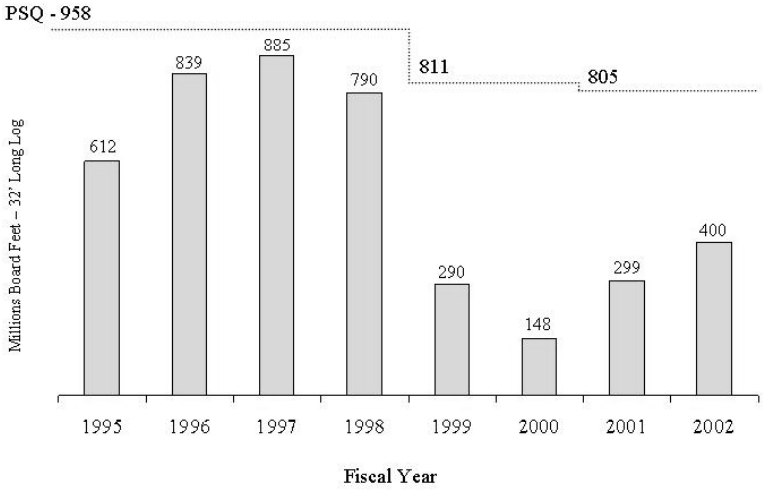
The FSEIS for the NWFP area and previous BAs for the RMPs displayed and discussed how the PSQs at the NWFP and individual RMP levels were reduced by the adoption of the NWFP. For example, the PSQ was reduced by 65 to 93% for the RMPs in Oregon and Washington. Additional information regarding PSQs for individual RMPs can be obtained from the previous BAs and BOs (Table 3).

Effectiveness Monitoring

The Northwest Forest Plan (NWFP) includes an Aquatic Conservation Strategy (ACS) that requires monitoring of aquatic ecosystems (USDA and USDI 1994b). The Aquatic and Riparian

Effectiveness Monitoring Plan (AREMP) was developed to fulfill this requirement. The final monitoring plan was approved in March 2001. The monitoring plan was designed to assess the condition of aquatic, riparian, and upslope ecosystems; develop ecosystem management decision support models to refine indicator interpretation; develop predictive models to improve the use of monitoring data; provide information for adaptive management by analyzing trends in watershed condition and identifying elements that result in poor watershed condition; and provide a framework for adaptive monitoring at the regional scale (Reeves et al. 2001). Monitoring is conducted at the subwatershed scale (USGS 6th-field hydrologic unit code). Subwatersheds are approximately 10,000-40,000 acres in size.

Figure 4. Timber Sale Volume Offered in Comparison to PSQ, 1995-2002



Sampling a minimum of 50 subwatersheds annually in the Forest Plan area will support regional analyses of ACS effectiveness. Over a five-year period, a total of 250 watersheds would be sampled (approximately 10% of the estimated number of subwatersheds). Post-sampling stratification will allow an evaluation at the subregional scale (e.g., provinces, river basins, National Forests, BLM districts) after five years. The AREMP conceptual framework allows more intense sampling than this, if managers wish to dedicate resources to deduce the Forest Plan's effectiveness at smaller spatial scales. Generally at least 50 units would need to be sampled at the scale desired to provide the necessary statistical rigor.

Under the AREMP conceptual framework, watersheds are stratified into three primary subsystems (channel, riparian, and upslope), each containing an array of physical and biological indicators that define its condition. Watershed condition is assessed by analyzing indicator values using a decision support model (DSM) incorporating relationships developed by provincial and regional experts. Results will be presented in the form of frequency distributions of the regional aggregation of watershed condition. Status and trend of individual indicator values will also be reported. Trend will be assessed by evaluating status of individual

watersheds and indicators over time. If the ACS is effective, the frequency distribution of watersheds or indicators should shift towards the better condition categories. Because the watershed processes, upon which the Forest Plan is based, operate over long timeframes (decades to centuries), trends may not be observed for 10-20 years or longer. Reports on status can be generated every year, but meaningful trends are more likely to be detected on a decadal timeframe. Depending on the intensity of sampling selected by agency managers, insight about ACS effectiveness at subregional scales or upon certain management practices could be available sooner.

A pilot project was conducted during the 2001 field season to test whether intensive sub-sampling could adequately characterize watersheds and to establish a data quality assurance program. Protocols for conducting upslope and riparian vegetation and roads analyses were also developed. Finally, a decision support model was constructed to evaluate the condition of individual sample reaches and watersheds. Collection of field data began in summer 2000 in four watersheds. The goal of the 2000 sampling was to test sampling protocols and determine the funding level and crew structure needed to implement the monitoring plan (Moyer et al. 2001). A pilot project was conducted in 2001 in 16 watersheds to continue the refinement of the protocols and to answer other questions related to implementing the monitoring plan.

Twenty-three watersheds were sampled in 2002 in the first year of full implementation. Funding was not sufficient to attain the goal to sample 50 watersheds. The 2002 effort implemented a quality assessment/quality control program, continued the refinement of data collection protocols, and resolved questions related to implementing the monitoring plan. Full implementation program costs were refined (Lanigan, personal communication 2003).

Environmental Factors

In the FSEIS for the proposed ACS amendment (USDA and USDI in press), the agencies considered whether large wildland fires, floods, droughts or El Niño weather patterns occurring since 1994 changed the Affected Environment or Environmental Consequences described in the FEMAT report (USDA et al. 1993) or the Northwest Forest Plan Final SEIS (USDA and USDI 1994a). These natural episodic disturbance events are an integral part of process- based management contained in the Aquatic Conservation Strategy. As stated in the FEMAT report (USDA et al. 1993) at page V-29 and the Northwest Forest Plan FSEIS (USDA and USDI 1994a) at page B-81:

> "The heart of the approach is the recognition that fish and aquatic organisms evolved within a dynamic environment."

The Northwest Forest Plan provided an adaptive management approach to environmental conditions and events. The Northwest Forest Plan recognized that ecosystems are not static but are ever changing in response to conditions and events. The Forest Service and BLM determined that large fires, flood, drought and El Niño events occurring since 1994 are not changed conditions that would invalidate the four components of the ACS (WA, watershed restoration, Key Watersheds, Riparian Reserves). The Northwest Forest Plan and Aquatic Conservation Strategy require consideration of natural disturbances in land management decisions.

AFFECTED SPECIES AND CRITICAL HABITAT

Bull Trout

The FWS BOs for the FS and BLM RMPs as amended by the NWFP and the FS and BLM RMPs as amended by the PACFISH and INFISH provided a general description of the status of bull trout in the NWFP (USDI 1998 and USDI 2000). The draft Bull Trout Recovery Plan provides information on the distribution and abundance of bull trout in all Distinct Population Segments in the conterminous United States, and offers the most recent status information for the species by recovery unit (USDI 2002). However, there is no new information regarding status of bull trout in the Coastal-Puget Sound DPS presented in the draft Bull Trout Recovery Plan. It remains as described in the 2000 NWFP bull trout BO (USDI 2000). Chapters 2, 5, 6, 7, 8, 20, 21, and 22 of the draft recovery plan describe the current distribution and abundance of the recovery units considered in this BA and are hereby incorporated by reference (USDI 2002). Since the initial listing of the DPSs, changes to the status of eight recovery units is summarized as follows:

Klamath Recovery Unit. Distribution and abundance information is found in Chapter 2, pages 10-16. Since bull trout were listed in 1997, the extent of bull trout habitat has expanded from 7 to 9 populations. A population has been established in Lost Creek, a stream within Crater Lake National Park in the Klamath Lake Core Area. A population was rediscovered in Coyote Creek within the Sycan River Core Area.

Willamette River Recovery Unit. Distribution and abundance information is found in Chapter 5, pages 9-21. Population counts are updated to 2001. A fourth local population may exist in the Middle Fork Willamette River above Hills Creek Dam, pending documentation of successful reproduction. There has been a bull trout fry introduction program at seven sites above Hills Creek dam.

Hood River Recovery Unit. Distribution and abundance information is found in Chapter 6, pages 8-13. One core area has been established in the Recovery Unit. It includes the Sandy River where three documented captures of bull trout have been reported since November 1999.

Deschutes River Recovery Unit. Distribution and abundance information is found in Chapter 7, pages 7-10. Current distribution is limited to the lower Deschutes Core Area which includes five local populations in Shitike Creek, Warm Springs River, and three Metolius River population complexes.

Odell Lake Recovery Unit. Distribution and abundance information is found in Chapter 8, pages 7-9. The Recovery Unit consists of Odell and Davis Lakes, streams draining into them and Odell Creek, which flows from Odell Lake to Davis Lake. Bull trout are occasionally observed in Odell Creek. One was caught by an angler in June 2000 at the Davis Lake inlet of Odell Creek.

Night snorkel juvenile bull trout counts in Trapper Creek increased from 26 in 1996 to 208 in 2001.

Lower Columbia River Recovery Unit. Distribution and abundance information is found in Chapter 20, pages 10-16. This Recovery Unit includes the Lewis River Core Area LRCA) and the Kickitat River Core Area (KRCA). Local populations in the Lower Columbia River Recovery Unit are found in Cougar, Pine and Rush Creek (Lewis River) and in West Fork Klickitat River.

The LRCA has reproducing populations in Lake Merwin, Yale and Swift Creek Reservoirs. During 2001, catch reports of two bull trout individuals indicate a resident population may exist in upper Lewis River. However, they may have been misidentified. There have been only two bull trout sightings downstream from Merwin Dam. The estimated spawning population in Cougar Creek, the sole documented spawning tributary to Yale Reservoir, has ranged from 0-40 individuals from 1979 to 2001. The fall 2001 count was 9 adults. Tagging studies in Swift Creek Reservoir from 1994-2000 estimated the spawning population ranged from 101-437 fish. In 2001 the bull trout population in Swift Creek Reservoir was estimated at 542 adults.

Bull trout are known to occur in the KRCA in the West Fork Klickitat River and tributaries. A survey in 2001 did not find bull trout in the Klickitat River mainstem above the confluence with the West Fork.

Fluvial bull trout are occasionally captured in the Columbia River mainstem. Five were caught incidentally in the northern pikeminnow fishery below Bonneville Dam from 1994-1998 and there are historic records of bull trout caught in fish wheels during the salmon fishery.

Middle Columbia River Recovery Unit. Distribution and abundance information is found in Chapter 21, pages 5-13. The Yakima River Basin Core Area is the sole Core Area. Eight subpopulations were identified at the time of listing of the DPS in 1998. The biological terminology has been revised. The draft Bull Trout Recovery Plan (USDI 2002) now identifies 13 local populations in the Core Area. Bull trout redd counts at index streams for the time frame from 1994-2001 are presented in a table. No trends are identified from analysis of the table data.

Upper Columbia River Recovery Unit. Distribution and abundance information is found in Chapter 22, pages 11-26. The final rule published in 1998 described eight subpopulations. The draft Bull Trout Recovery Plan (USFWS 2002) now identifies three Core Areas (CA): The Wenatchee River; Entiat River; and, Methow River.

The Wenatchee River CA has six local populations and its stronghold is the Chiwawa River. Redd survey counts for four local populations are presented for the time period from 1989-2001. No trends were discussed.

The Entiat River CA has two local populations; the mainstem Entiat River and Mad River. The two CAs are thought to be isolated by a natural thermal barrier. There are very small numbers of bull trout remaining in the Entiat River. Spawning counts for the years 1998-2001 range from 0-6. Spawning counts for the Mad River index reach for the years 1989 to 2001 indicate that

counts have been higher in recent years. The 1998-2001 counts ranged from 30-45, while the 1989-1997 counts ranged from 10-23.

The Methow River CA has eight local populations. Spawning counts for the years 1998-2001 indicate that the greatest number of spawners is consistently found in the mainstem Twist River (38-67).

A radio-tracking study was conducted in the mainstem upper Columbia River in 2001 on 39 bull trout captured at three mainstem dams: Rock Island (7); Rocky Reach (22); and, Wells (10). In all cases, the released fish continued moving upstream.

Anadromous Fish

The status of all listed salmon and steelhead considered in this BA has been recently reviewed by NOAAF. Under the direction of NOAAF, a draft report of the updated status of listed ESUs of salmon and steelhead titled "Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead" was prepared in March 2003 (draft USDC 2003). The draft report summarizes preliminary conclusions of the NOAAF Biological Review Team (BRT) regarding the updated status of 26 ESA-listed ESUs of salmon and steelhead from Washington, Oregon, Idaho and California. Of the candidate species considered in this BA, the Lower Columbia River/Southwest Washington coho salmon ESU is included in the status review.

Chinook salmon life history types are described in Section A.1 of the draft status update. Steelhead life histories and habitat preferences are described in Section B.1. Coho salmon life histories and habitat preferences are described in Section C.1. Sockeye salmon life histories and habitat preferences are described in Section D.1. Chum salmon life histories and habitat preferences are described in Section E.1. A brief summary follows for updated status by ESU for species considered in this BA. The draft status update does not include the Central Valley fall and late run Chinook salmon ESU, Puget Sound/Strait of Georgia coho salmon ESU or the Oregon Coast steelhead ESU, which all have candidate status.

Snake River fall Chinook salmon. Previous status reviews identified a steady and severe decline in abundance since the early 1970s, loss of primary spawning and rearing areas upstream from Hells Canyon Dam complex, increased non-local hatchery contribution to adult escapement over Lower Granite Dam, and relatively high harvest impacts (Section A.2.1). There has been an upward trend in returns over Lower Granite Dam since the mid 1990's. Returns classified as natural origin exceeded 2,600 fish in 2001, compared to a 1997-2001 geometric mean natural origin count of 871. Both the long and short-term trends in natural returns are positive. Harvest impacts on Snake River fall Chinook declined after listing and have remained relatively constant in recent years. There have been major reductions in fisheries impacting this stock. Mainstem conditions for subyearling Chinook migrants from the Snake River have generally improved since the early 1990s. The outside (outside the Snake River) hatchery component has decreased as a percentage of the run at Lower Granite Dam from the 1998/99 status reviews (five year average of 26.2%) to 2001 (8%). This reflects an increase in the Lyons Ferry component,

systematic removal of marked hatchery fish at the Lower Granite trap, and modifications to the Umatilla supplementation program to increase homing of fall Chinook release groups.

Snake River spring/summer Chinook salmon. A previous BRT conclusion was that the ESU escapement had dropped to a small fraction of historical levels. Causes were mainstem hydropower development including altered flow regimes, impacts on estuarine habitats, regional habitat degradation, and risks associated with use of outside hatchery stocks (Section A.2.2). Returns of spring Chinook measured at Lower Granite Dam showed a large increase over recent year abundances. However, 98.4% of the 2001 run was estimated to be of hatchery origin. The 1997-2001 geometric mean total return for the summer run component at Lower Granite was slightly more than 6,000, compared to the geometric mean of 3,076 for the years 1987-96. Long-term trend and lambda estimates were below 1 for all natural production data sets. Short-term trends and lambda estimates were generally positive with relatively large confidence intervals. Tucannon River, Poverty Flat and Sulfur Creek index areas had the lowest short-term lambda estimates in the series. Harvest impacts are now generally low. Increased escapement led to an increase in harvest beginning in 2000. Tributary habitat conditions vary widely among the various drainages of the Snake River. There is habitat degradation in many areas of the basin, reflecting impacts of forest, grazing, and mining practices. Spring and summer Chinook are produced at a number of artificial production facilities, with releases from outside basin stocks currently a small fraction of the total release in the basin.

Upper Columbia River spring-run Chinook salmon. Long-term trends for abundance of populations have been generally negative, but escapement increased substantially in 2000 and 2001 (Section A.2.4). These runs are subject to passage mortality associated with mainstem hydroelectric projects. Many populations have rebounded somewhat from critically low levels at the time of the last status review evaluation (Section A. 3, page 120). This ESU continues to have a large hatchery influence.

Puget Sound Chinook salmon. Describes previously identified threats to habitat from human development. They include forest practices, agriculture and urbanization. Harvest impacts have been high. Long-term trends in abundance and median population growth rates for naturally spawning populations both indicate that about one-half the populations are declining and one-half are increasing in abundance. Section A.2.4.4 discusses updated threats and focuses on harvest rates and hatchery fish implications. More populations have increased than decreased over the four years since the last assessment. (Section A.3, page 122).

Lower Columbia River Chinook salmon. Section A.2.5 provides new information on loss of historic habitat by barriers. The ESU is substantially modified from the historical population structure. Most "tule" fall Chinook populations are potentially at risk of extinction. Lewis River "brights," which are a late fall-run, has the highest likelihood among identified populations of being self-sustaining under current conditions. High hatchery production continues to pose risks to natural populations. Most populations have not seen pronounced increases in recent years as occurred in other ESUs (Section A.3, page 121).

Upper Willamette River Chinook salmon. Section A.2.6 provides new information since the last status update on spawner abundance through 2002 in the Clackamas River, 2001 in the

McKenzie River, and 2001 at Willamette Falls on the Willamette River. New information is also provided for redd surveys, the fraction of hatchery origin spawners in the McKenzie and North Santiam Rivers, the hatchery fraction of the Clackamas River, and on recent hatchery releases. The ESU is substantially modified from its historical population structure, with most populations extirpated. The only population considered potentially self-sustaining is the McKenzie. Although the number of adult spring Chinook crossing Willamette Falls has been in the same range for the last 50 years, there is concern that a large fraction is hatchery produced. There is also a concern that about one-third of the historically available habitat is currently inaccessible behind dams (Section A.3, page 121).

California Coastal Chinook salmon. Section A.2.7 summarizes risk factors and status. Primary causes for concern were low abundance, reduced distribution and generally negative trends in abundance, especially for spring-run populations. Previous status reviews considered the following to pose significant risks: degradation of freshwater habitats due to agricultural and forestry practices; water diversions, mining, urbanization, and severe recent flood events. Effects of hatcheries and transplants were of less concern than other factors in previous assessments of this ESU. New data presented included spawner surveys and adult counts in the Eel River and tributaries to the Eel River, Mad River and in Freshwater Creek (tributary to Humboldt Bay). No information exists to suggest new risk factors or substantial amelioration of risk factors noted in previous reviews. The current evaluation expressed concern for continued evidence of low population sizes relative to historic abundance (Section A.3, page 122). Concerns for genetic integrity are moderate to low because hatchery production is on a minor scale.

Sacramento River winter-run Chinook salmon. The single most obvious challenge to winter Chinook was construction of Shasta Dam which blocked access to the entire historic spawning habitat (Section A.2.8.1). There is a single population remaining and it is dependent upon cold water releases from Shasta Dam. Escapement fell from highs near 100,000 in the 1960s to below 200 fish in the 1980s. Other threats identified include inadequately screened diversions, predation at artificial structures and by nonnative species, overfishing, pollution from mines, adverse flow conditions, high summer water temperatures, unsustainable harvest rates, passage problems at various structures and vulnerability to drought. Status of winter Chinook has been improving. Harvest impacts have been reduced due to changes in ocean fisheries. The main concerns of the BRT relate to the fact that there is only one population remaining and it has been displaced from its original spawning habitat (Section A.3, page 122).

Central Valley spring-run Chinook salmon. Threats are described for three categories: loss of most historic spawning habitat; degradation of remaining habitat; and genetic threats from the Feather River Hatchery spring Chinook program (Section A.2.9.1). Most currently available habitat is susceptible to high summer water temperatures. Only three self-sustaining wild populations remain. There are many small hydropower and water diversion dams that have reduced or eliminated flows at critical migration periods. New information on abundance for the three self-sustaining populations indicate that increases in populations beginning in the 1990s has continued. This may be a result of significant habitat improvements, as well as reduced ocean fisheries and a favorable terrestrial climate. The BRT expressed continuing concern by the loss

of diversity caused by extirpation of populations from most of the Central Valley, including all the San Joaquin tributaries. (Section A.3, page 121).

Snake River Basin steelhead. There are ten populations within the ESU. The primary BRT conclusion identified in the 1998 status review was a sharp decline in natural stock returns in the mid-1980s. The high proportion of hatchery in the run was also identified as a concern. Annual estimates of steelhead returns to specific production areas within the Snake River are generally not available. Annual run estimates are limited to counts of the aggregate return over Lower Granite Dam, which remained at relatively low levels through the 1990s. The 2001 run size at Lower Granite Dam was substantially higher than the 1990s. Overall, long-term trends for four of the nine available series remained negative. Short-term trends improved relative to the period analyzed for the previous status review. The Idaho Department of Fish and Game concluded that Idaho steelhead failed to meet replacement for most generations since 1985, based upon parr density survey results through 1999 (this did not include information on the increased returns for 2001 and 2002). Hatchery programs for steelhead production continue. Tucannon River artificial production switched to a local brood stock beginning with the 1999/2000 cycle year.

Upper Columbia River steelhead. Harvest rates on upper river steelhead are reduced form historical levels. Hatchery returns predominate in the populations in the Wenatchee, Methow and Okanogan Rivers. Previous BRT conclusions identified a number of concerns including major hatchery supplementation programs, high harvest rates on smolts in trout fisheries, and degradation of habitats (especially from grazing, irrigation diversions and hydroelectric dams) (Section B.2.2). Hatchery production increased from the 1960s to the 1990s. The last two to three years has seen an encouraging increase in the number of naturally produced fish. However, this is still a fraction of interim recovery targets (Section B.3, page 100).

Middle Columbia River steelhead. Previous BRT conclusions identified serious declines in the John Day, Yakima River and Deschutes River basins (Section B.2.3.1). High summer and low winter water temperatures, water withdrawals, degradation of riparian vegetation and instream structure were identified as habitat concerns. With some exceptions, the recent 5 year average abundance for natural steelhead within this ESU was higher than in the last status review. Short-term trends in major production areas were positive for seven of 12 areas. However, all of the production area trends indicate relatively low escapement levels in the 1990s. Relative high numbers of hatchery origin steelhead returning from releases outside of the basin continue to enter the Deschutes River. The actual number that spawn in the Deschutes is unknown. The BRT had difficulty drawing conclusions about the ESU for two reasons. The status of different populations within the ESU varies greatly. Also, there is uncertainty about how to evaluate the contribution of resident fish (Section B.3, page 101).

Lower Columbia River steelhead. The draft status update provides new information on spawner updates through 2001 or 2002, dependent upon the stream. New information is also provide on the fraction of hatchery spawners and harvest estimates, estimates of historical abundance, recent hatchery releases, an assessment of resident rainbows, and an assessment of proportion of habitat currently inaccessible (Section B.2.4.2). A number of populations have a sizable fraction of hatchery origin natural spawners. The majority of populations have a long-term declining trend. All of the major risk factors identified by previous BRTs still remain. Most populations

are at relatively low abundance, but many have shown higher returns in the past two to three years. (Section B.3, page 102).

Upper Willamette River steelhead. New data is provided for redd counts and dam/weir counts through 2000, 2001, or 2002. There are also new estimates for the hatchery fraction and harvest rate through 2000 (Section B.2.5). The BRT could not identify a single population that is naturally self-sustaining. Estimation of natural productivity is confounded by the presence of hatchery origin spawners. There has been recent elimination of the hatchery winter-run program. The counts indicate an increase in abundance in 2001, likely at least in part as a result of improved marine conditions. The total abundance is small for an ESU. Recent increases are encouraging but it is uncertain if they can be sustained (Section B.3, page 102).

Northern California steelhead. There are two major barriers to fish passage: Matthews dam on the Mad River and Scott Dam on the Eel River. Poor forest practices and land use practices, combined with catastrophic flooding in 1964 were thought to have caused significant and persistent causes of decline in habitat quality that persisted to the time of ESA listing. Non-native Sacramento pikeminnow have been introduced in the Eel River and could be predators on juvenile steelhead (Section B.2.6). Analysis suggests that the Eel River population is declining in both the long and short-terms. Lack of data for this ESU was a cause for uncertainty in the status update (Section B.3, page 103).

Central California Coast steelhead. Two significant dam blockages occur in the Russian River and other smaller fish passage problems are widespread (Section B.2.7). Other habitat concerns include urbanization and poor land use practices, catastrophic flooding in 1964 resulting in habitat degradation, and dewatering due to diversions and irrigation. There was a downward trend for juvenile production in five independent populations for which a trend was estimated. Updated hatchery information is presented. There were no time-series data for this ESU, but a variety of evidence suggests that the Russian River run, the largest in the ESU has been reduced in size and continues to decrease. Concern was also expressed about populations in the southern range of the ESU in Santa Cruz County and the South Bay area (Section B.3, page 103).

California Central Valley steelhead. Existing populations are small and subject to habitat degradation (Section B.2.10). Much of the historic cool water habitat is now above impassable dams. Concerns include extirpation from most of the historic range, a decline in the single time series of abundance that is available, a declining proportion of wild fish in spawning runs, deleterious interactions with hatchery fish, various habitat problems, and a lack of ongoing population assessments. Hatchery production is apparently large compared to natural production, based upon trawl sampling. The trawl data suggests that the population continues to decline. A concern identified by the BRT was continued use of out-of-ESU steelhead by two hatcheries (Section B.3, page 105).

Oregon Coast Coho salmon. Ocean run sizes estimated for the ESU in 1996 were approximately one-third that of the 1950s and one-tenth those of the late 1800s. At that time, long term trend estimates of abundance were all negative. However, more recent escapement estimates indicate a positive trend for the Umpqua and Mid/South Coast Monitoring Areas, but negative in the North/Mid Coast. In 1996, the BRT was also concerned about habitat degradation and hatchery

production and genetic risks. Harvest impacts were high, ranging from 60% to 90% in the time period from the 1960s to the 1980s. Hatchery and harvest reforms have been enacted since the mid-1990s. The ESU had the highest number of adult spawners for any year in several decades in 2001. However, it was preceded by three years of low spawner escapements. The BRT was concerned that if the long-term decline in productivity reflects deteriorating conditions in freshwater habitat, this ESU could face serious risks of local extinctions in the next cycle of poor ocean conditions (Section C.3, page 75).

Southern Oregon/Northern California Coast Coho salmon. Data is sparse for historic abundance in the California portion of the ESU, but abundance is estimated to be considerably lower than historic levels, with some local extirpations. For example, the percentage of streams in Del Norte County estimated to still support coho salmon in the mid-1990s was 46%, and 55% in Humboldt County. Specific risk factors identified by the earlier BRT included low current abundance, severe declines from historic levels, local extinctions, long-term downward trends, degraded freshwater habitat, and widespread hatchery production using exotic stocks (Section C.2.2). The draft status update was limited by lack of data on escapement of natural spawners. The only reliable long-term time series is available for the Rogue River which indicates trends are upwards for mean spawner abundance both in the short (10 year) and long (22 year) trends. Less reliable indices for California trends suggest downward trends and no detectable trends. The BRT remains concerned about the large number of hatchery fish in the Rogue, Klamath and Trinity systems (Section C.3, page 76).

Central California Coast Coho salmon. Data is sparse for historic abundance in the ESU, but abundance is estimated to be considerably lower than historic levels, with some local extirpations. Risk factors identified by the previous BRT included low abundance compared to historic levels, widespread local extinctions, clear downward trends in abundance and extensive habitat degradation (Section C.2.3). The main stocks in the ESU have been heavily influenced by hatcheries, with many out-of-ESU transfers. In 2002 it was estimated that coho salmon remain in 42% of streams they historically used in the ESU. There is no time series spanning eight or more years for adult abundance free from hatchery influence in the ESU. Artificial propagation has been reduced since the ESU was listed in 1996 and harvest has been reduced. A number of populations in the southern portion of the range appear either extinct or nearly so. The BRT estimates this to be the case in the southern two-thirds of the ESU, including several major river basins (Section C.3, page 77).

Lower Columbia River/Southwest Washington Coho salmon. Please note that the draft status review update refers to this ESU as the Lower Columbia coho salmon ESU. Long-term trends in abundance are slightly positive and short-term trends slightly negative for the Clackamas River (Section C.2.4.2). The Sandy River population has similar trends to the Clackamas River. There was no information presented for trends in Washington rivers. Both Oregon and Washington populations are dominated by hatchery production. There is little natural production outside the Sandy and Clackamas Rivers in Oregon, and no populations in Washington with appreciable natural production. Thus 21 of 23 historically present populations are currently or nearly extirpated. There was no discussion presented about habitat concerns. The most serious overall concern of the BRT was the nearly total absence of naturally produced spawners throughout the ESU (Section C.3, page 77).

Hood Canal summer-run Chum salmon. Threats previously identified for this ESU included degradation of spawning habitat, low river flows, possible competition among hatchery and naturally-produced chum salmon juveniles, and high levels of incidental harvest in salmon fisheries (Section E.2.1.1). Other concerns included increasing urbanization of the Kitsap Peninsula, recent increases in pinniped populations in Hood Canal, and hatchery supplementation programs. Long-term trends in abundance and median population growth rates indicate that the majority of populations are declining. Those populations with the greatest long-term population growth rates are the Union and Quilcene. Harvest rates have declined in recent years from a median of 9.6% for the earliest five years of data to 5% for the most recent five year period. New threats identified by the BRT include negative interactions with hatchery fish of other species through predation, competition, behavior modification or disease transfer. Preliminary BRT conclusions in the draft status update are that seven of 16 historic populations have been extirpated and widespread loss of estuary and lower floodplain habitat remains a concern (Section E.3, page 29).

Columbia River Chum salmon. The previous BRT found dramatic declines in abundance and distribution from historic levels. The remaining populations exhibit low productivity (Section E.2.2). New information indicates that of 16 estimated historic populations, 13 have been extirpated and the number currently viable may be 0-3. Encouragingly, there has been a substantial increase in the two populations and the new (or newly discovered) "I-205" population. This ESU has shown low productivity for decades. Unofficial reports indicate that 2002 escapement numbers may be greatly increased in some locations (Section E.3, page 29).

Snake River sockeye salmon. This ESU was listed amid uncertainty as to whether or not the Redfish Lake sockeye were a distinct population from kokanee that are present in relatively large numbers in the lake. From 1991 to present investigations have determined that there is a component of the kokanee population in Redfish Lake that spawn at the same time and place as the sockeye and are termed "residual" sockeye salmon. Otolith evaluations have determined that many of the outmigrants from Redfish Lake had a resident female parent.

Annual adult returns to Redfish Lake Creek weir have ranged from 0 to 8 from 1988 to 1998, and from 7-257 from 1999 to 2002. The latter four years reflect progeny of the captive brood stock program, which has been in place for this ESU since 1991. Releases of progeny from the brood stock program have been made in Pettit Lake and Alturas Lake in attempts to establish separate populations.

Proposed Critical Habitat for Bull Trout DPSs

On November 29, 2002, the FWS proposed designation of critical habitat for the Klamath River and Columbia River distinct population segments of bull trout pursuant to the Endangered Species Act of 1973, as amended (Table 1). Critical habitat includes bull trout habitat across the species' range in Idaho, Montana, Oregon, and Washington. Critical habitat is proposed in 25 units that correspond to recovery units identified in the Draft Recovery Plan (USDI 2002). Proposed critical habitat for the Klamath River DPS is entirely within Unit 1. Proposed critical habitat for the Columbia River DPS is in Units 2 though 25. For the Klamath River DPS, the

proposed critical habitat designation includes approximately 296 miles (mi) of streams and 33,939 acres (ac) of lakes and marshes in Oregon. For the Columbia River DPS, the proposed critical habitat designation totals approximately 18,175 mi of streams and 498,782 ac of lakes and reservoirs.

The lateral extent of the proposed fluvial and adfluvial critical habitat is defined in the federal register notice. The lateral extent of critical habitat, for each proposed stream reach, is the width of the stream channel as defined by its bankfull elevation. Critical habitat extends from the bankfull elevation on one side of the stream channel to the bankfull elevation on the opposite side. Adjacent floodplains are not proposed as critical habitat. The lateral extent of proposed lakes and reservoirs is defined by the perimeter of the water body as mapped on standard 1:24,000 scale maps.

The FWS proposed critical habitat designation identified those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. These physical and biological features include, but are not limited to: space for individual and population growth, and for normal behavior; food, water, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distribution of a species. All areas proposed as critical habitat for bull trout are within the historic geographic range of the species and contain one or more of these physical or biological features essential to the conservation of the species. The FWS also included a list of known primary constituent elements with the critical habitat description. The primary constituent elements may include, but are not limited to, features such as spawning sites, feeding sites, and water quality or quantity.

The FWS determined the primary constituent elements for bull trout from studies of their habitat requirements, life-history characteristics, and population biology, as outlined above. These primary constituent elements are:

1) Permanent water having low levels of contaminants such that normal reproduction, growth and survival are not inhibited;
2) Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence;
3) Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures;
4) Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine substrate less than 0.63 cm (0.25) in diameter and minimal substrate embeddedness are characteristic of these conditions;
5) A natural hydrograph, including peak, high, low and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations;

6) Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity;
7) Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows;
8) An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish; and
9) Few or no predatory, interbreeding, or competitive nonnative species present.

Within the NWFP area, critical habitat is proposed on 9 FS or BLM administrative units in 8 recovery units of the Klamath River and Columbia River bull trout DPSs. The 9 FS or BLM administrative units are the CRGNSA, Deschutes, Gifford Pinchot, Mt. Hood, Okanogan, Wenatchee, Willamette, Winema NFs and Eugene District. The proposed fluvial and adfluvial critical habitat for the 8 recovery units is listed in Table 16. The 8 recovery units are the Klamath River, Willamette River, Hood River, Deschutes River, Odell Lake, Lower Columbia River, Middle Columbia River and Upper Columbia River. Of the 8 recovery units considered in this analysis, the largest area of adfluvial critical habitat is proposed for the Klamath and Deschutes recovery units, and the longest fluvial critical habitat is proposed for the Deschutes, Middle Columbia River and Upper Columbia River recovery units (Table 16).

The vast majority of the proposed critical habitat on FS and BLM lands is National Forest. The Eugene District is the only BLM administrative unit with proposed critical habitat, a minuscule 0.4 mi. of fluvial habitat in the Willamette River unit (Table 16). The Wenatchee and Deschutes administrative units have the greatest quantity of proposed critical habitat Both of these administrative units have proposed critical habitat in two recovery units as well. These administrative units have the largest quantity of adfluvial habitat areas as well as some of the longest fluvial habitat. On the other hand, the CRGNSA has the least amount of proposed critical habitat.

Critical Habitat for Sacramento River Winter-run Chinook

Critical habitat for this species includes the river water, river bottom (including those areas and associated gravel used by winter-run Chinook salmon as spawning substrate), and adjacent riparian zone used by fry and juveniles for rearing. Specific water temperature criteria, minimum instream flow criteria, and water quality standards represent physical features of the winter run Chinook salmon's habitat that are essential for the species conservation. Biological features of the designated critical habitat that are considered vital for winter run Chinook include unimpeded adult upstream migration routes, spawning habitat, egg incubation and fry emergence areas, rearing areas for juveniles, and unimpeded downstream migration routes for juveniles.

Table 16. Proposed fluvial and adfluvial critical habitat for recovery units of the Klamath River and Columbia River DPS within the NWFP area is displayed by recovery unit and FS and BLM administrative unit. The proposed critical habitat for the entire recovery unit is also displayed.

Unit #	Recovery Unit	EUG	CRGNSA	DES	GIP	MTH	OKA	WEN	WIL	WIN	NWFP BLM & FS Total (%)	Proposed Critical Habitat
1	Klamath River Basin Stream (Miles)	0	0	0	0	0	0	0	0	22.6	22.6 (8)	295
	Lake (Acres)	0	0	0	0	0	0	0	0	0	0	33,952
4	Willamette River Basin Stream (Miles)	0.4	0	0	0	0	0	0	90	0	90.4 (43)	209
	Lake (Acres)	0	0	0	0	0	0	0	4,058	0	4,058 (46)	8,904
5	Hood River Basin Stream (Miles)	0	0	0	0	47.6	0	0	0	0	47.6 (46)	110.3
	Lake (Acres)	0	0	0	0	91	0	0	0	0	91 (100)	91
6	Deschutes River Stream (Miles)	0	0	113.4	0	0	0	0	0	0	113.4 (23)	498
	Lake (Acres)	0	0	12,019	0	0	0	0	0	0	12,019 (52)	22,966
7	Odell Lake Stream (Miles)	0	0	11.3	0	0	0	0	0	0	11.3 (100)	11.3
	Lake (Acres)	0	0	6,611	0	0	0	0	0	0	6,611 (100)	6,611
19	Lower Columbia River Stream (Miles)	0	0.1	0	32.8	0	0	0	0	0	32.9 (16)	210
	Lake (Acres)	0	0	0	4,572	0	0	0	0	0	4,572 (37)	12,488
20	Middle Columbia River Stream (Miles)	0	0	0	0	0	0	220.4	0	0	220.4 (42)	529
	Lake (Acres)	0	0	0	0	0	0	14,986	0	0	14,986 (100)	14,986
21	Upper Columbia River Stream (Miles)	0	0	0	0	0	155.6	157.3	0	0	312.9 (53)	565
	Lake (Acres)	0	0	0	0	0	56	2,438	0	0	2,494 (100)	2,497
	Stream Totals	0.4	0.1	124.7	32.8	47.6	155.6	377.7	90	22.6	851.5 (35)	2427.6
	Lake Totals	0	0	18,630	4,572	91	56	17,424	4,058	0	44,831 (44)	102,495

Physical and biological features that are essential for the conservation of winter-run Chinook salmon, based on the best available information, include:

1. Access from the Pacific Ocean to appropriate spawning areas in the upper Sacramento River;
2. The availability of clean gravel for spawning substrate;
3. Adequate river flows for successful spawning, incubation of eggs, fry development and emergence, and downstream transport of juveniles;
4. Water temperatures between 42.5 and 57.5 degrees F (5.8 and 14.1 C) for successful spawning, egg incubation, and fry development,
5. Habitat areas and adequate prey that are not contaminated,
6. Riparian habitat that provides for successful juvenile development and survival, and
7. Access downstream so that juveniles can migrate from the spawning grounds to San Francisco Bay and the Pacific Ocean.

Designated critical habitat for this species includes 302 miles of the Sacramento River from Keswick Dam downstream to the Sacramento-San Joaquin Delta and most of the San Francisco and San Pablo Bay area North of the Bay Bridge. In the Sacramento River, critical habitat includes the river water, river bottom and the adjacent riparian zone. NOAAF limited "adjacent riparian zones" in this case to mean only those areas above a streambank that provide cover and shade to the near shore aquatic areas.

The Mendocino NF Red Bluff Recreation Area contains about 2.5 miles of shoreline on the Sacramento River which is approximately .004 percent of the total shoreline designated as critical habitat. SRWC are found in this part of the river seasonally as adults, fry and juveniles. Adult fish migrate to the upper Sacramento River from December through June and juveniles are generally moving downstream between August and October. Most spawning occurs in the Sacramento River upstream of Red Bluff.

Critical Habitat for Snake River Salmon ESUs

On December 28, 1993, the NOAAF designated critical habitat for the Snake River sockeye salmon, Snake River chinook salmon, and Snake River fall chinook salmon pursuant to the ESA (Table 1). The designated habitat for these 3 Snake River salmon ESUs consists of river reaches of the Columbia, Snake, and Salmon Rivers as well as some lakes and most tributaries of the Snake and Salmon rivers presently or historically accessible to chinook salmon (except reaches above impassable natural falls and select Dams).

The critical habitat designation identified those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. Essential Snake River salmon habitat consists of four components: (1) Spawning and juvenile rearing areas; (2) juvenile migration corridors; (3) areas for growth and development to adulthood; and (4) adult migration

corridors. The areas important to these 4 salmon habitat components were identified as well as their essential features.

Critical habitat for all listed Snake River salmon includes the bottom and water of the waterways and the adjacent riparian zone. The riparian zone includes those areas within 300 feet of the normal line of high water of a stream channel or from the shoreline of a standing body of water. Essential features of these areas include adequate: (1) Substrate (especially spawning gravel); (2) water quality; (3) water-quantity; (4) water temperature; (5) water velocity; (6) cover/shelter; (7) food; (8) riparian vegetation; (9) space; and (10) migration conditions. The essential features of adult and juvenile migration corridors are the same excluding adequate food for adults.

The CRGNSA contains waterways, shoreline or riparian areas near shoreline of the Columbia River. The Columbia River is designated critical habitat essential to juvenile and adult migration of the listed Snake River salmon, but does not provide essential habitat for spawning or rearing. On the Washington State side of the River, the CRGNSA has approximately 14.3 miles shoreline or 520.5 acres of riparian areas near shoreline of critical habitat. The Oregon State side of the River, the CRGNSA has approximately 8.25 miles shoreline or 299.7 acres of riparian areas near shoreline of critical habitat. The Snake River salmon adult and juvenile fish migrate through this segment of the Columbia River during the Spring and Summer.

Critical Habitat for Coho Salmon ESUs

On May 5, 1999, the NOAAF designated critical habitat for the Southern Oregon/Northern California Coast and Central California Coast coho salmon ESUs pursuant to the ESA (Table 1). The critical habitat consists of accessible reaches of all rivers (including estuarine areas and tributaries) within these two coho salmon ESUs. The geographic extent is further described in the Federal Register notice (Table 1) and is hereby incorporated by reference (64 FR 24049 5/5/99). The areas represent the current freshwater and estuarine range of the listed species. For both ESUs, critical habitat includes waterways substrate, and adjacent riparian zones below longstanding, naturally impassable barriers. Inaccessible areas above several dams in the range of these ESUs, that currently block access to habitats historically occupied by coho, were not designated as critical habitat.

In designating critical habitat, NOAAF considered the following requirements of the species:
(1) Space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing offspring; and generally, (5) habitats that are protected from disturbance or are representative of historical geographic and ecological distributions of this species. In addition to these factors, NOAAF identified the physical and biological features (primary constituent elements) of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. The essential coho salmon habitat may consist

of but is not limited to the following five features: (1) Spawning sites; (2) food resources; (3) water quality; (4) water quantity; and (5) riparian vegetation.

Eleven administrative units contain waterways, substrate or riparian areas designated as critical habitat for the two coho salmon ESUs (Table 2). The Ukiah District is the only unit with designated critical habitat for the Central California Coast coho salmon ESU. Ten administrative units have critical habitat for the Southern Oregon/Northern California Coast coho salmon ESU. Those FS and BLM administrative units are: Klamath, Mendocino, Rogue River, Six Rivers, Siskiyou, Shasta-Trinity, Arcata, Coos Bay, King Range NCA, and Medford.

DESCRIPTION OF THE PROPOSED ACTION

This section describes the proposed action that consists of the continued implementation of the 30 individual RMPs as amended by the Preferred Alternative (Alternative A) of the ACS FSEIS (USDA and USDI in press) hereafter named the proposed ACS amendment. Section 5.1 generally describes the RMPs and refers the reader to previous assessments that addressed the individual RMPs. The ACS of the NWFP is described as well. Section 5.2 describes the Preferred Alternative (Alternative A) of the Final Supplemental Environmental Impact Statement for *Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan; National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl* (USDA and USDI in press). Section 5.3 describes three additional areas within the ranges of species considered in this BA.

RMPs

The RMPs generically authorize various categories of federal actions which respond to the needs for forest habitat, goods and services. While all of the FS and BLM administrative units implement many of the same land-use practices, the levels of activities and outputs will vary depending on local conditions. Even though RMPs set important parameters for the authorization of specific projects, with some exceptions, RMPs do not provide the final authorization for project implementation. Final authorization of projects depends on the analysis of site-specific effects and consistency with appropriate management direction (RMPs, ROD, regulations, etc) in NEPA analysis, and ESA consultation. Effects of individual projects to ESA listed species and designated critical habitat are evaluated in ESA Section 7 consultation. Appendix A presents a description of analytical processes involved in project planning by the FS and BLM. A complete description and analysis of the individual RMPs and management direction are described in previous BAs prepared by the action agencies (USDA 1995b, 1995c, 1995d, 1995e, 2000; USDI 1997b, 2000c; USDA and USDI 1997a, 1997b, 1998, 1999), and are hereby incorporated by reference. The subsequent BOs issued by the consulting agencies are listed in the consultation history section 3.1 (Table 3), and are

incorporated herein by reference (USDC 1996a, USDC 1996b, 1997b, 1997c, 1997d, 1998a, 1998c, 1998d, 1999, 2000b, 2000c, 2001; USDI 1997b, 1998, 2000a, 2000b, 2000c) . Management actions which are typically conducted on FS and BLM lands include forest management, recreation, grazing, mining, watershed restoration, fish and wildlife habitat management, fire/fuels management, land exchanges and acquisitions, and a variety of special uses.

Forest management can be divided into two broad categories of activities: timber harvest and associated actions, and silvicultural treatments used to develop desirable stand characteristics. Timber harvest and associated actions can include: road construction, landing construction, renovation and use, including quarry operation; maintenance of existing roads; yarding and skidding logs; regeneration or thinning treatments; and salvage of dead or dying trees. Road maintenance actions include surface maintenance (blading), surface replacement, drainage maintenance and repair, vegetation management (brushing, limbing, seeding and mulching along roadways), slide repair, sign maintenance and repair, and maintenance, replacement and repair of major structures (bridges and major culverts). Silvicultural treatments include planting; plantation maintenance and release (density management, pre-commercial thinning and control of competing vegetation); animal damage control; and fertilization.

Recreational actions provide for a wide range of developed and dispersed recreational opportunities. Developed recreation actions include campground maintenance, and recreation site and trail construction/maintenance. Dispersed activities include general public use of federal lands (hunting, fishing, camping, hiking, etc), environmental education, and management of off-highway vehicles.

Range management activities on federal lands include livestock grazing, and rangeland improvements (fencing, water development, livestock handling facilities, and vegetation management).

Mining activities can be combined into two broad categories based on the method of extraction. Surface mining includes dredging and pit mining while underground mining utilizes tunnels or shafts to extract minerals. Activities associated with mining include roads and supporting structures and facilities.

Watershed restoration actions on federal lands are an integral part of management to aid in the recovery of fish habitat, riparian habitat, and water quality. Road decommissioning, culvert upgrades, riparian and stream habitat improvements, fish passage improvements, and riparian tree planting treatments are typical restoration actions.

Fish and wildlife management actions on federal lands may include stream and riparian habitat surveys; surveys for fish (smolt traps, snorkeling, spawning ground counts, electro-fishing), amphibians, and survey and manage species identified in the NWFP ROD, and wildlife habitat improvements (tree topping and falling).

Fire and fuels management actions include the suppression of wildfire and prescribed fire used to meet resource management objectives. Prescribed burning is used for fuels management for wildfire hazard reduction (under-burning), restoration of desired vegetation conditions, management of habitat and silvicultural treatments, i.e. site preparation (broadcast burning or pile burning). Pump chances, or water withdrawal sites, are created as water sources for fire suppression. Usually located next to roads, these sites are typically small, excavated ponds or short spurs for vehicle access to streams or lakes.

Land exchanges and acquisitions are made to benefit a variety of uses and values. Land tenure adjustments are made to improve public access, acquire important habitats or resources and improve the efficiency of managing federal lands.

Federal lands are a source of forest products for domestic and commercial uses. These products include firewood, mushrooms, ferns, boughs, mosses and similar products. FS and BLM administrative units issue permits for the collection of these products.

FS and BLM issue a variety of permits for the use of federal lands. Permits maybe issued for utility and powerline corridors, communication sites, domestic and municipal water lines and diversions, and hydroelectric facilities. Road use permits are issued to allow for the transportation of commercial commodities on FS and BLM managed roads. Road right-of-ways are issued to private individuals and companies for the construction and use of access roads across federal lands.

Amended RMP Direction per the NWFP ROD

The NWFP ROD (USDA and USDI 1994b) formally amended the existing USFS and BLM RMPs by the addition of new land allocations (ROD, page 6-7), and S&Gs (ROD, Attachment A, as well as in its entirety). Four NFs within the NWFP area were without approved RMPs when the ROD was signed. Therefore, unit plans and resource management plans of the Klamath, Mendocino, Shasta-Trinity and Six Rivers NF were initially amended by the ROD and later incorporated into their approved RMPs. These amending land allocations and S&Gs generally override those in existing plans, except for any provisions of the existing plans more stringent in their protection (see ROD, pages 11-12). A more complete description of all of the RMPs and their more stringent protections are included in the previous NOAAF and FWS BOs and the 1999 addendum to the 1997 BA (USDA 1999).

Since the ROD was signed, some BLM and FS administrative have updated individual RMPs incorporating the ROD land allocations, S&Gs, and other protective language and provisions. Table 17 lists the 30 FS and BLM administrative units in the NWFP area, the approval year of the RMPs and method by which the Aquatic Conservation Strategy of the NWFP was adopted by the administrative units. The CRGNSA plan is different from the other RMPs in that it is not amended by and doesn't incorporate the NWFP.

The CRGNSA management plan applies to all ownerships within the scenic area. The National Forest lands within the Columbia River Gorge National Scenic Area (CRGNSA) are governed by the RMPs of the Gifford Pinchot and Mt. Hood NFs in Washington and Oregon, respectively, which are amended by the Northwest Forest Plan. More stringent protection in the CRGNSA management plan takes precedence over the RMP direction. Because the Forest Plans are amended by NWFP and the CRGNSA incorporates the direction of the most protective plan, the CRGNSA Plan has not incorporated the NWFP. For a complete description and analysis of the CRGNSA, see the March 23, 1999, addendum to the 1997 BA, which describes protective measures on federal and private land in the proposed action and cumulative effects sections, respectively.

The National Forest System (NFS) lands in the National Scenic Area are governed by the Gifford Pinchot or Mt. Hood RMPs. An amendment to the RMP of the Gifford Pinchot and Mt Hood National Forests does apply to the NFS lands in the Scenic Area; however, it does not amend the National Scenic Area Plan.

Table 17. RMP approval date and method by which the NWFP ACS was adopted by BLM and FS administrative units within the NWFP area.

		NWFP ACS	
Administrative Unit	***RMP Date***	***Amended***	***Incorporated***
Columbia River Gorge NSA	1992	See GIP and MTH	
Deschutes	1990	X	
Gifford Pinchot	1990	X	
Klamath	1995		X
Lassen	1993	X	
Mendocino	1995		X
Modoc	1991	X	
Mount Baker Snoqualmie	1990	X	
Mount Hood	1990	X	
Okanogan	1989	X	
Olympic	1990	X	
Rogue River	1990	X	
Six Rivers	1995		X
Siskiyou	1989	X	
Shasta-Trinity	1995		X
Siuslaw	1990	X	
Umpqua	1990	X	
Wenatchee	1990	X	
Willamette	1990	X	
Winema	1990	X	
Arcata	1992	X	
Coos Bay	1995		X
Eugene	1995		X
King Range NCA	1974	X	
Klamath Falls	1995		X
Medford	1995		X
Redding	1993	X	
Roseburg	1995		X
Salem	1995		X
Ukiah	1984	X	

Aquatic Conservation Strategy - Components and Objectives

The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The ROD states that "[t]he strategy is designed to protect salmon and steelhead habitat on Federal lands managed by the USFS and BLM within the range of Pacific Ocean anadromy." However, the ROD does not completely cover that range (the southern and eastern ranges of steelhead, for example, are not covered by the NWFP ROD).

Forest Service and BLM-administered lands within the range of the Northern Spotted Owl are being managed to achieve the following nine ACS objectives:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must
provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

In addition to the above ACS objectives, the NWFP ROD (USDA and USDI 1994b) contains a summary of the ACS for each of the primary ACS components: Riparian Reserves (ROD, page B-17); Key Watersheds (ROD, page B-19); WA (ROD, page B-30); and Watershed Restoration (ROD, page B-33). These summaries were included in the ROD to explain the expected contribution of each individual component to the overall ACS, and are hereby incorporated by reference.

Components of the Aquatic Conservation Strategy

All four of the ACS components are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. LSRs are also an important component of the ACS. The S&Gs under which LSRs are managed provide increased protection for all stream types. Because these reserves possess some late-successional characteristics, they can offer core areas of high quality stream habitat that will act as refugia and centers from which degraded areas can be recolonized as they recover. Streams in these reserves may be particularly important for endemic or locally distributed fish species and stocks.

1. Riparian Reserves: Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special S&Gs apply (USDA and USDI 1994b at B-12). S&Gs prohibit and regulate activities in Riparian Reserves that may retard or prevent attainment of the ACS objectives. Riparian Reserves include those portions of a watershed directly coupled to streams and rivers, that is, the portions of a watershed required for maintaining hydrologic, geomorphic, and ecological processes that directly affect standing and flowing water bodies such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. Riparian Reserves occur at the margins of standing and flowing water, intermittent stream channels and ephemeral ponds, and wetlands. Riparian Reserves generally parallel the stream network but also include other areas necessary for maintaining hydrologic, geomorphic, and ecological processes.

Under the ACS, Riparian Reserves are used to protect, maintain and restore riparian structure and function of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are

dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity within and between watersheds.

The Riparian Reserve widths are established based on ecological and geomorphic factors necessary to meet ACS objectives for different types of water bodies. These widths are designed to provide a high level of fish habitat and riparian protection: "Although Riparian Reserve boundaries may be adjusted on permanently-flowing streams, the prescribed widths are considered to approximate those necessary for attaining Aquatic Conservation Strategy objectives." (USDA and USDI 1994b at B-13).

The Riparian Reserves in combination with other withdrawn and reserve areas, and standards and guidelines will protect the overall ecosystem including the aquatic ecosystem: "The total system of withdrawn and reserved areas, along with the specified standards and guidelines, would meet the need to protect the overall ecosystem while providing for other management opportunities." (USDA and USDI 1994a at F-62); and reiterated elsewhere, "The total system of Key Watersheds, along with Riparian Reserves and the specified standards and guidelines, will meet the need to protect the overall aquatic ecosystem while providing for other management opportunities." (USDA and USDI 1994a at F-64).

WA will identify critical hill slope, riparian, and channel processes that must be evaluated in order to delineate Riparian Reserves and assure protection of riparian and aquatic functions. The prescribed Riparian Reserve widths could be modified in the future if a WA is completed, a site-specific analysis is conducted and described, and the rationale for Riparian Reserve boundaries is presented through the appropriate NEPA decision-making process.

The prescribed widths of Riparian Reserves apply to all watersheds. Riparian Reserves, as described in detail in the ACS on pages B12-B17 of the ROD, are specified for five categories of streams or water bodies as follows:

Fish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest

Permanently flowing nonfish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

Constructed ponds and reservoirs, and wetlands greater than 1 acre - Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.

Lakes and natural ponds - Riparian Reserves consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

Seasonally flowing or intermittent streams, wetlands less than 1 acre, and unstable and potentially unstable areas - This category applies to features with high variability in size and site-specific characteristics. At a minimum, the Riparian Reserves must include:

The extent of unstable and potentially unstable areas (including earth flows);

The stream channel and extending to the top of the inner gorge;

The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation; and

Extension from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

Note: A site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class.

Note: Intermittent streams are defined as any nonpermanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria.

2. Key Watersheds: Refugia are a cornerstone of most species conservation strategies. They are designated areas that either provide, or are expected to provide, high quality habitat. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat as well as areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program (see Watershed Restoration).

The ACS includes two designations for Key Watersheds. Tier 1 Key Watersheds (Aquatic Conservation Emphasis) contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 1 Key Watersheds consist primarily of watersheds identified previously by the Scientific Panel on Late-Successional Forest Ecosystems (Johnson et al. 1991), and in the Scientific Analysis Team Report (Thomas et al. 1993). The network of 143 Tier 1 Key Watersheds ensures that refugia are widely distributed across the landscape. While 21 Tier 2 (other) Key Watersheds may not contain at-risk fish stocks, they are important sources of high quality water (USDA and USDI 1994b, pages B-18-19).

Long-term management within Key Watersheds requires WA prior to further resource management activity. In the short term, until WA can be completed, minor activities such as those that would be categorically excluded under NEPA regulations (except timber harvest) may proceed if they are consistent with ACS objectives and apply Riparian Reserves and S&Gs. Timber harvest, including salvage, can not occur in Key Watersheds without a WA. Key Watersheds that currently contain poor quality habitat are believed to have the best opportunity for successful restoration and will receive priority in any watershed restoration program (USDA and USDI 1994B, pages B-18-19).

Roadless areas are an important component of Key Watersheds, aiding listed fish survival and recovery. Inventoried roadless areas are those that were originally designated under RARE II, and were expanded in scope with the Roadless Area Conservation Rule (USDA 2001). To protect the remaining high quality habitats within Key Watersheds, the S&Gs for Key Watersheds instructs that no new roads will be built in remaining unroaded portions of roadless areas (USDA and USDI 1994B, page C-7). In addition, WA is required in all Key Watersheds and all roadless areas prior to resource management (USDA and USDI 1994B, page C-3). In addition, existing system and nonsystem road mileage is targeted for reduction for areas of Key Watersheds outside roadless areas. At a minimum there will be no net increase in roads in Key Watersheds. S&Gs specific to Key Watersheds are summarized on page C-7 of the ROD.

3. Watershed Analysis: The ROD states that WA focuses on implementing the ACS. WA is one of the principal analyses that will be used in making decisions on implementation of the ACS. It is required in Key Watersheds, for roadless areas in non-Key Watersheds, and Riparian Reserves prior to project decisions. Watershed analyses must be completed before initiating actions within a Key Watershed except minor activities such as those that would be categorically excluded under NEPA regulations (except timber harvest) may proceed if they are consistent with the RMP including S&Gs associated with relevant land allocations.

WA has a critical role in providing for aquatic and riparian habitat protection. In planning for ecosystem management and establishing Riparian Reserves to protect and restore riparian and aquatic habitat, overall watershed condition and the array of processes operating within the watershed need to be considered. Effective protection strategies for

riparian and aquatic habitat on Federal lands must accommodate the wide variability in landscape conditions present across the Pacific Northwest. WA plays a key role in the ACS, ensuring that aquatic system protection is fitted to specific landscapes (USDA and USDI 1994B, page B-20).

WA focuses on collecting and compiling information within the watershed that is essential for making sound management decisions. The results of watershed analyses may include a description of the resource needs, capabilities, opportunities, the range of natural variability, spatially explicit information that will facilitate environmental and cumulative effects analyses for NEPA, and the processes and functions operating within the watershed. WA will identify potentially disjunct approaches and conflicting objectives within watersheds. The information from WA is used to develop priorities for funding, and implementing actions and projects, and is used in developing monitoring strategies and objectives. The participation of adjacent landowners, private citizens, interest groups, industry, various government agencies, and others in watershed analyses is promoted.

WA consists of technically rigorous and defensible procedures designed to identify processes that are active within a watershed, how those processes are distributed in time and space, the current upland and riparian conditions of the watershed, and how all of these factors influence riparian habitat and other beneficial uses. The analysis is conducted by an interdisciplinary team consisting of geomorphologists, hydrologists, soil scientists, biologists and other specialists as needed. Information used in this analysis includes: maps of topography, stream networks, soils, vegetation, and geology; sequential aerial photographs; field inventories and surveys including landslide, channel, aquatic habitat, and riparian condition inventories; census data on species presence and abundance; water quality data; disturbance and land use history; and other historical data (e.g., streamflow records, old channel surveys).

WA is organized as a set of modules that examine biotic and abiotic processes influencing aquatic habitat and species abundance (e.g., landslides, surface erosion, peak and low stream flows, stream temperatures, road network effects, coarse woody debris dynamics, channel processes, fire, limiting factor analysis for key species). Results from these modules are integrated into a description of current upland, riparian, and channel conditions; maps of location, frequency, and magnitude of key processes; and descriptions of location and abundance of key species.

WA provides the contextual basis at the site level for decision makers to set appropriate boundaries of Riparian Reserves, plan land use activities compatible with disturbance patterns, design road transportation networks that pose minimal risk, identify what and where restoration activities will be most effective, and establish specific parameters and activities to be monitored. More detailed site-level analysis is conducted to provide the information and designs needed for specific projects (e.g., road siting or timber sale layout) so that riparian and aquatic habitats are protected.

WA provides the ecological and geomorphic basis for changing the size and location of Riparian Reserves necessary to meet ACS objectives. Ultimate design of Riparian Reserves is likely to be a hybrid of decisions based on consideration of sites of special ecological value, slope stability, wildlife dispersal corridors, endemic species considerations, and natural disturbance processes.

4. Watershed Restoration: Watershed restoration is an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. Restoration will be based on WA and planning. WA is essential to identify areas of greatest benefit-to-cost relationships for restoration opportunities and greatest likelihood of success. WA can also be used as a medium to develop cooperative projects involving various landowners. In many watersheds the most critical restoration needs occur on private lands downstream from federally managed lands. Decisions to apply a given treatment depend on the value and sensitivity of downstream uses, transportation needs, social expectations, risk assessment of probable outcomes for success at correcting problems, costs, and other factors. WA, including the use of sediment budgets, provides a framework for considering benefit-to-cost relations in a watershed context. Thus, the magnitude of restoration needs within the planning area will be based on WA.

With reference to roads, restoration may range from obliteration or full decommissioning (closing and stabilizing a road to eliminate potential for storm damage and the need for maintenance) to simple road upgrading, which leaves the road open (See B-31 of the ROD for a description of upgrading). The decision to apply a given treatment depends on the value and sensitivity of downstream uses, transportation needs, social expectations, assessment of probable outcomes for success at correcting problems, costs, and other factors. The magnitude of regional restoration needs will be based on WA.

Vegetative and silviculture programs are implemented to restore large conifers in Riparian Reserves, stabilize unstable areas, and thin densely-stocked stands. These practices can be implemented along with silvicultural treatments in uplands areas, although the practices will differ in objective and, consequently, design.

In-stream restoration, based on the interpretation of physical and biological processes and deficiencies during WA, can be an important component of an overall program for restoring fish and riparian habitat. In-stream restoration measures are inherently short term and, to be successful, must be accompanied by riparian and upslope restoration to achieve long-term watershed restoration. In-stream restoration, including in-channel structures, are not to be used to mitigate for management actions that degrade existing habitat, as a substitute for habitat protection, or to justify risky land management activities and practices. Priority must be given to protecting existing high quality habitat (USDA and USDI 1994B, pages B-31-32).

Other Plan Components

Other plan components that could have the potential for beneficial or adverse effects to ESA-listed fish species are Fire Management Plans and Access Travel Management Plans. Fire Management Plans are particularly important in watersheds where there is a high risk of high intensity, catastrophic fire. Many activity-specific S&Gs in the ROD address the need to reduce fuel loads and avoid risks of catastrophic fire. Typically these requirements are contained in sections of the S&Gs titled *Fire and Fuels Management* or *Fire Suppression and Prevention*.

Access Travel Management Plans are important in reducing any redundancy in the existing road network within Key and non-Key Watersheds containing ESA-listed fish species. WA information should aid in completing Access Travel Management Plans.

Monitoring and Adaptive Management Provisions

For a complete understanding of all the ROD's monitoring requirements, consult USDA and USDI (1994b). However, specific types of aquatic monitoring are expected under the implementation of the ACS (USDA and USDI 1994B, pages B-32, 33).

A variety of monitoring, specific to achieving the stated objectives of the ACS, is discussed in the ROD as an important component of management actions. General objectives of monitoring will be to: (1) determine whether the ROD and its corresponding S&Gs are being consistently followed throughout the NWFP area; (2) determine the effectiveness of management practices at multiple scales, ranging from individual sites to watersheds; and (3) validate whether ecosystem functions and processes have been maintained as predicted. In addition, monitoring will provide feedback to fuel the adaptive management process. Monitoring at the 20 to 200 square mile watershed level will link monitoring for ecosystem management objectives for multiple scales of province, river basin, smaller watershed and site-specific levels.

The ROD states that riparian area monitoring must be dispersed among the various landscapes rather than concentrated at a few sites and then extrapolated to the entire forest. Logistical and financial constraints require a stratified monitoring program that includes: post-project site review, reference to subdrainages, basin monitoring, a water quality network, and landscape integration of monitoring data.

Long-term systematic monitoring in selected watersheds will be necessary to provide reference points for effectiveness and validation monitoring (USDA and USDI 1994B, page B-33). Reference watersheds, subbasins, and individual sites have been selected as part of the overall adaptive management process described as part of these S&Gs. Study plans are cooperatively developed based on province, river basin, and/or watershed level analyses. Long-term data sets from reference watersheds will provide an essential basis for adaptive management and a gauge by which to assess trends in in-stream condition.

Monitoring is conducted and results will be documented, analyzed and reported by the agency or agencies responsible for land management in any particular watershed. Reports are reviewed by local interdisciplinary teams. In addition, water resource

regulatory agencies may review results to determine compliance with appropriate standards, and province and river basin-level strategies.

Summary of Land Allocations and Standards & Guidelines

For a summary of Land Allocations and S&Gs, refer to the ROD, page 6 and 7, (USDA and USDI 1994b) and the analysis of effects of ROD Land Allocations and S&Gs can be found in the previously prepared BOs and BAs.

Proposed amendment to the RMPs

The Secretaries of Agriculture and the Interior are proposing to amend the ACS portions of the RMPs except for the CRGNSA within the Northwest Forest Plan area. Projects needed to achieve Northwest Forest Plan goals have been delayed or stopped due to misapplication of certain passages in the ACS. Specific language has been interpreted to mean that every project must achieve all ACS objectives at all spatial and temporal scales. This interpretation suggests land managers must demonstrate that a project will maintain existing conditions (or lead to improved conditions) at every spatial and temporal scale. Any project that may result in site-level disturbance to aquatic or riparian habitat, no matter how localized or short-term, could be precluded under this interpretation.

The CRGNSA Plan would be indirectly affected by the proposed ACS amendment since only the NF RMPs within the CRGNSA would be amended (see BA section 5.11 for details regarding CRGNSA). The Preferred Alternative (Alternative A) of the Final Supplemental Environmental Impact Statement for *Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan; National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl* (USDA and USDI in press) is assessed and evaluated with the RMP actions previously assessed for ESA consultation and summarized in this BA. Under the amendment, land managers continue to be required to design projects to comply with applicable standards and guidelines (S&Gs) in Sections C and D of Attachment A in the Record of Decision (ROD) (USDA and USDI 1994b), and other applicable standards in Resource Management Plans. No further finding of ACS consistency is required.

All RMPs for Forest Service and BLM administrative units within the Northwest Forest Plan area would be amended under the Proposed ACS amendment. Management of the Coquille Forest is also affected.

The action would not result in a major change to any RMP, nor would it alter their objectives or multiple-use goals. The action would not adjust management area boundaries. The amendment does not change the goals of the 1994 NWFP ROD. All components of the ACS (Riparian Reserves, Key Watersheds, WA and watershed restoration) remain in place. The amendment emphasizes a concept from FEMAT Chapter V (USDA et al. 1993) and the NWFP ROD, Page B-12 (USDA and USDI 1994b):

"Standards and guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of Aquatic Conservation Strategy objectives."

The amendment also clarifies that information in WA will be used to provide context for project planning, but is not a decision-making process in and of itself. This principle is emphasized in the NWFP ROD (USDA and USDI 1994b), the Final SEIS (USDA and USDI 1994a), and the 1995 *Federal Guide for Watershed Analysis* (USDA et al 1995). The amendment clarifies that:

- The proper scales for Federal land managers to evaluate progress toward achievement of the ACS objectives are the watershed and broader scales. No single project should be expected to achieve all ACS objectives.
- No management activities can be expected to maintain the existing condition at all scales and all times; disturbance from management activities must be considered in the context of the condition of the fifth-field watershed as a whole.

- Decision-makers are required to document how the agency used relevant information from applicable watershed analysis to provide context for project planning.

- To comply with Riparian Reserve Standards and Guidelines that reference ACS objectives, the decision maker must document that analysis has been completed, including a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given fifth-field watershed, and how the project or management action maintains the existing condition or restores it toward that range of natural variability.

The amendment retains all existing components of the ACS, including Riparian Reserves, Key Watersheds, WA and watershed restoration as well as ACS objectives. It reinforces concepts about appropriate scales of analysis and the role of S&Gs. It removes the expectation that all projects must achieve all ACS objectives, and reinforces the role of WA in providing context for actions that may affect aquatic or riparian habitat.

For comparison purposes, existing ACS language (No Action Alternative) and the amendment language (Alternative A) are displayed in Table 18. The amendment changes language in Attachment A of the 1994 NWFP. The amendment to the RMPs in the NWFP area does not approve any individual projects. Individual projects are subject to site-specific analysis required by NEPA and other laws, policy and regulations.

Table 18. Comparison of No Action and Preferred Alternative (Alternative A) Wording

Excerpt	No Action (Existing)	Alternative A
Page B-10	The important phrases in these standards and guidelines are "meet Aquatic Conservation Strategy objectives, "does not retard or prevent attainment of Aquatic Conservation Strategy objectives, and "attain Aquatic Conservation Strategy objectives." These phrases, coupled with the phrase "maintain and restore" within each of the Aquatic Conservation Strategy objectives define the context for agency review and implementation of management activities. Complying with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions. The baseline from which to assess maintaining or restoring the condition is developed through a watershed analysis. Improvement relates to restoring biological and physical processes within their ranges of natural variability.	Deleted in entirety

Table 18. Comparison of No Action and Preferred Alternative (Alternative A) Wording (continued)

Excerpt	No Action (Existing)	Alternative A
Page B-10	The standards and guidelines are designed to focus the review of proposed and certain existing projects to determine compatibility with the Aquatic Conservation Strategy objectives. The standards and guidelines focus on "meeting" and "not preventing attainment" of Aquatic Conservation Strategy objectives. The intent is to ensure that a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives. The decision maker will use the results of watershed analysis to support the finding. In order to make the finding that a project or management action "meets" or "does not prevent attainment of" the Aquatic Conservation Strategy objectives, the analysis must include a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given watershed, and how the proposed project or management action maintains the existing condition or moves it within the range of natural variability. Management actions that do not maintain the existing condition or lead to improved conditions in the long term would not "meet" the intent of the Aquatic Conservation Strategy and thus, should not be implemented.	The four components of the Aquatic Conservation Strategy (Riparian Reserves, Key Watersheds, watershed analysis, and watershed restoration), in combination with application of relevant standards and guidelines in Sections C and D (and other relevant standards in Resource Management Plans) are intended to achieve Aquatic Conservation Strategy Objectives.[1] Under the Aquatic Conservation Strategy, the agencies must maintain existing conditions or implement actions to restore conditions at the fifth-field watershed scale over the long term. No management activities can be expected to maintain the existing condition at all scales and all times; disturbance from management activities must be considered in the context of the condition of the fifth-field watershed as a whole.[2] The project record will demonstrate how the agency used relevant information from applicable watershed analysis to provide context for project planning, recognizing that watershed analysis is not a decision-making process in and of itself, nor is watershed analysis a decision document. If watershed analysis is not required or available, or does not contain relevant information, the project record will provide evidence that project effects were considered relative to the watershed condition. Projects should be designed to comply with applicable standards and guidelines in Sections C and D (and other applicable standards in Resource Management Plans). No further finding of ACS consistency is required. To comply with Riparian Reserve Standards and Guidelines that reference ACS objectives, the decision maker must document that analysis has been completed, including a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given fifth-field watershed, and how the project or management action maintains the existing condition or restores it toward that range of natural variability. [3]

FOOTNOTES

[1] Federal agencies may not be able to attain objectives within watersheds with relatively low proportions of Federal lands (see Northwest Forest Plan FSEIS page 3&4-82).

[2] The Federal Guide for Watershed Analysis (1995) discusses issues of scale and explains why the fifth-field watershed scale "satisfies many needs and offers a consistent format for reporting results of an analysis." The Federal Guide states that analysis at the watershed scale "provides the context for management through the description and understanding of specific ecosystem conditions and capabilities." Watershed analysis requirements are described later in Section B. All other requirements and uses of WA described on pages B-20 through B-30 of the ROD would remain unchanged.

[3] The Federal Guide for Watershed Analysis discusses Range of Natural Variability on page 20.

Table 18. Comparison of No Action and Preferred Alternative (Alternative A) Wording (continued)

Excerpt	No Action (Existing)	Preferred Alternative (Alternative A)
Page C-31	As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that may retard or prevent attainment of the Aquatic Conservation Strategy objectives. Watershed analysis and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds.	As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that may retard or prevent attainment of the Aquatic Conservation Strategy objectives at the 5th field watershed scale over the long term**.** Watershed analysis and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds. To comply with Riparian Reserve Standards and Guidelines that reference ACS objectives, the decision maker must complete an analysis that includes a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given 5th field watershed, and how the project or management action maintains the existing condition or restores it toward that range of natural variability.

Three Additional Areas with Special Circumstances

Three areas governed with the NWFP ACS have special circumstances that warrant consideration in this BA. Those circumstances are discussed below for Mendocino NF, Wenatchee NF and Coquille Forest.

Mendocino NF

The Mendocino National Forest is located entirely within the NWFP area except for the Lake Red Bluff Recreation area which is located adjacent to the Sacramento River in the City of Red Bluff. This area is about 490 acres and includes campgrounds, trails, boat ramps, a fish ladder operated by the US Fish and Wildlife Service, and a non-profit Sacramento River Discovery Center. Various recreation activities are the primary use of the area. The most intensive use of the river occurs during boat racing and water skiing events that are covered under a special use permit. The RMP ROD stated that the NWFP ACS would be incorporated on the entire forest including the Lake Red Bluff area.

Wenatchee NF

There are approximately 25,000 acres or about 1% of the Wenatchee NF area that is outside the range of the Northern spotted owl and technically would not be under the Northwest Forest Plan. These lands are within the PACFISH ACS area but the Wenatchee NF RMP was not amended by the PACFISH decision notice. These lands are primarily along the Columbia River Breaks with other small parcels in the lower Wenatchee, Tieton and Naches watersheds. The lands are very dry with few perennial streams let alone fish habitat. The Forest is managing these lands using NWFP ACS specifically the S&Gs for the Riparian Reserves and WA to guide management. The

Forest Supervisor has committed to the continued management of these lands under the NWFP ACS in a letter addressed to the Forest Service Columbia River Basin PACFISH coordinator dated July 1, 1999 (USDA 1999).

Coquille Forest

The Proposed ACS amendment will also affect management of the Coquille Forest. In 1996 Congress passed an act creating the Coquille Forest from about 5400 acres of BLM administered lands within the area of the NWFP. These acres are now held in trust by the United States for the benefit of the Coquille Indian Tribe, and are no longer administered by the BLM. The Act required that management of the Coquille Forest lands will be subject to the standards and guidelines of Federal Forest plans on adjacent or nearby Federal lands, now and in the future. The adjacent Federal lands are Coos Bay BLM District lands; therefore, the Coquille Forest is affected by this proposed amendment to the Coos Bay BLM Resource Management Plan.

EFFECTS TO SPECIES OR CRITICAL HABITAT

Effects to Listed or Candidate Species

The effects to the ESA-listed or candidate species displayed in Table 2 by the continued implementation of the RMPs as amended by the proposed ACS amendment and the specified non-NWFP areas are described in sections 6.1.1 and 6.1.2, respectively. In Section 6.1.1.1 the effects of implementing the component parts of the ACS are described. This includes the Riparian Reserves, Key and non-Key Watersheds, Watershed Analysis, Watershed Restoration, ACS monitoring, and implementing S&Gs. Also included in Section 6.1.1.1 is a description of the effects of the land allocations of the NWFP to the fish species. The effects of implementing land management actions are described in Section 6.1.1.2. The land management actions include: 1) Watershed restoration; 2) Forest management, including roads, plantation management and release practices; 3) Recreation; 4) Livestock grazing; 5) Mining; 6) Riparian silvicultural practices; 7) Surveys and inventories; 8) Wildfire suppression; 9) Land exchanges and acquisitions; 10) Special forest products; and, 11) Actions under special use permits. The effects of the 3 specified non-NWFP areas, the Mendocino NF, Wenatchee NF and Coquille Forest, are discussed in sections 6.1.2.1, 6.1.2.2 and 6.1.2.3, respectively.

RMPs and Amendments

Numerous BLM and FS administrative units have concluded ESA consultations on continued implementation of their RMPs as previously amended or incorporating the Northwest Forest Plan, for ESA-listed fish species prior to the Preferred Alternative (Alternative A) (consultation history is provided in Table 3 and Table 4). The BAs and reinitiation letters for the prior consultations described the effects of the continued implementation of the RMPs (USDA 1995b, 1995c, 1995d, 1995e, 2000; USDI 1997b, 2000c, 2001; USDA and USDI 1997a, 1997b, 1998, 1999) on the ESA-listed fish species. In each instance, the regulatory agency arrived at a "No Jeopardy" conclusion in the corresponding BO.

The Northwest Forest Plan acknowledges that disturbances are natural occurrences within forested habitats and that management of this habitat without disturbance is impossible. Some level of disturbance is necessary, and even beneficial to the ecosystem. The clarified language for the ACS (as a result of Preferred Alternative A) is expected to result in improved decisions that reflect these concepts (USDA and USDI in press). Management of disturbance risks and management after natural disturbance are discussed on pages B-7 and B-8 of the NWFP ROD (USDA and USDI 1994b). A discussion of several strategies employed in the application of the ACS to approach the goal of maintaining the "natural" disturbance regime is found on page B-9. The Preferred Alternative (Alternative A) (USDA and USDI in press) does not change the intent of the Aquatic Conservation Strategy, "to restore and maintain the ecological health of watersheds and the aquatic ecosystems contained within them on Federal lands." (USDA and USDI 1994b, page B-9).

The proposed ACS amendment (USDA and USDI in press) does not result in environmental impacts beyond those already disclosed in the Northwest Forest Plan Final Supplemental Environmental Impact Statement (FSEIS) (USDA and USDI 1994a). The Northwest Forest Plan FSEIS disclosed programmatic effects of several alternatives for land management across the Northwest Forest Plan area, including the selected Alternative 9. The effects of the Preferred Alternative (Alternative A) in the ACS FSEIS (USDA and USDI in press) are consistent with the effects of Alternative 9 in the Northwest Forest Plan. These effects are discussed in Appendix B in the ACS FSEIS (USDA and USDI in press).

The effects to listed fish species by the implementation of the RMPs as amended by the Proposed Amendment to the ACS are presented in two sub-sections: 1). The effects of continued implementation of the ACS components; and, 2) The effects of continued implementation of programmatic categories of land management actions.

RMPs and the Proposed ACS Amendment

The ACS is a long-term strategy that seeks to prevent further degradation and restore habitat over broad landscapes. Although it may take decades to accomplish all of the objectives, some improvements in the aquatic ecosystems are expected within 10-20 years (USDA and USDI 1994b, page B-9). The USFS and BLM management activities are directed to be consistent with the ACS. The proposed ACS amendment directs

project design to comply with applicable S&Gs in Sections C and D (and other applicable standards in RMPs). No further finding of ACS consistency is required (USDA and USDI in press). Relevant information from WA will provide context for project planning.

The four major components of the ACS: Riparian Reserves, Key Watersheds, WA, and Watershed Restoration, in combination with application of pertinent S&Gs, are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. LSRs also are an important component of the ACS, because the S&Gs for LSRs generally increase protection for all stream types within them, especially in the longer term. Finally, there is a monitoring section specific to achieving the stated objectives of the ACS (USDA AND USDI 1994b, page B-32).

Implementation of the RMPs, consistent with the S&Gs included in the NWFP, is expected to result in improved habitat conditions (over various time scales) for resident and anadromous fish species on lands within federal ownership and show progress towards attainment of the nine ACS objectives. This, in turn, is expected to provide for increased survival of various life stages of these fish and an increased probability of restoring and maintaining viable populations.

During development of the NWFP, the Forest Ecosystem Management Assessment Team (FEMAT) assessed management alternatives to determine the probability of ensuring the viability of various plant and animal species. To accomplish this, the FEMAT convened assessment panels comprised of experts to elicit high quality judgments about expected effects of the alternatives on these species. The panelists' assessments resulted in likelihoods that each alternative would provide sufficient habitat on Federal lands to provide for various distributions of species populations over the 100 year assessment period (USDA et al. 1993).

The assessment of the management alternative implemented in the NWFP (option 9) concluded that there would be an 80 percent or greater likelihood of providing sufficient aquatic habitat to support stable, well-distributed populations of the seven salmonid races/species/groups evaluated (USDA et al. 1993). Except for the listed chum salmon, all of the species (including the various life forms e.g. sea-run, resident and seasonal races) addressed in this BA were evaluated by the FEMAT (USDA et al. 1993). This analysis of available aquatic habitat prepared for the management guidance provided in the NWFP was not quantitative. However, this assessment represents the best available analysis of the expected effects of implementation of the LRMPs and RMPs as amended by or incorporating the NWFP on fish habitat on Federal lands in the action area.

Chum salmon are the only salmonid fish species addressed in this BA whose likelihood of survival wasn't directly assessed by the FEMAT (USDA et al. 1993). The reason this species was not considered was their limited distribution on federal lands within the range of the northern spotted owl. Because of the limited distribution of chum salmon on federal land, the administrative units may provide a limited amount of spawning habitat. Chum salmon, like other salmon species, require clean gravels to reproduce successfully.

Since the seven salmonid fish groups serve as reasonable indicators of aquatic ecosystem health, it is reasonable to assume that habitats of chum salmon on federal land would be similarly affected by the implementation of the NWFP.

The ACS Objectives

The proposed ACS amendment does not change the ACS objectives. The nine objectives range from maintaining and restoring the distribution, diversity, and complexity of watershed and landscape-scale features to maintaining and restoring habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species (USDA and USDI 1994b, page B-11).

The proposed amendment has clarified how ACS objectives are to be used. There is not a requirement to determine the consistency of site-scale projects with each ACS objective.
The FSEIS states that the four components of the ACS, in combination with application of relevant S&Gs in Sections C and D (and other relevant standards in Resource Management Plans) *are intended to achieve Aquatic Conservation Strategy Objectives*. (Emphasis added). Consequently, "Projects should be designed to comply with applicable standards and guidelines in Sections C and D (and other relevant standards in Resource Management Plans). No further finding of ACS consistency is required (USDA and USDI in press)." However, it should be kept in mind that federal agencies may not be able to obtain objectives within watersheds with relatively low proportions of federal lands (USDA and USDI 1994a at 3&4-82).

The ACS FSEIS clarifies the spatial and temporal scales at which the ACS is intended to operate. They are the fifth field watershed scale and the long-term:

> "Under the Aquatic Conservation Strategy, the agencies must maintain existing conditions or implement actions to restore conditions at the fifth-field watershed scale over the long term. No management activities can be expected to maintain the existing condition at all scales and all times; disturbance from management activities must be considered in the context of the condition of the fifth-field watershed as a whole;
>
> "As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that may retard or prevent attainment of the Aquatic Conservation Strategy objectives at the 5th field watershed scale over the long term**."**

The Federal Guide for Watershed Analysis (USDA et al.1995) discusses issues of scale and explains why the 5th field watershed scale "satisfies many needs and offers a consistent format for reporting results of an analysis." The Federal Guide states that

analysis at the watershed scale "provides the context for management through the description and understanding of specific ecosystem conditions and capabilities."

In addition, "The project record will demonstrate how the agency used relevant information from applicable watershed analysis to provide context for project planning, recognizing that watershed analysis is not a decision-making process in and of itself, nor is watershed analysis a decision document."

ACS Components

1) Riparian Reserves

Riparian Reserves are a primary component of the ACS. The proposed amendment has not changed the role of Riparian Reserves. Riparian-dependent resources would continue to receive primary emphasis within Riparian Reserves. Special S&Gs would continue to be applied. "As a general rule, S&Gs for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the ACS objectives." (USDA and USDI 1994b, page C-31). The NWFP ROD states in several places that the Riparian Reserve S&Gs are "necessary to meet" the ACS objectives or are designed "to meet" the objectives. Consequently, compliance with Riparian Reserve S&Gs provides a measure of assurance that a project is consistent with the ACS. The FSEIS (USDA and USDI in press) states: "Projects should be designed to comply with applicable standards and guidelines in Sections C and D (and other relevant standards in Resource Management Plans). No further finding of ACS consistency is required."

S&Gs for Riparian Reserves are more extensive than for any other ACS component and strongly influence the design and application of management actions within the Riparian Reserves to conserve riparian-dependent resources, including ESA-listed fish species. The Preferred Alternative (Alternative A) for the ACS FSEIS defines the intent of RR S&Gs that reference ACS objectives. Interpretation and an example of application of this type of S&G under the proposed ACS amendment are presented later in this section (6.1.1.1 ACS Components, Standards and Guidelines).

Riparian Reserves capture all historic or current ESA-listed fish species habitat and unoccupied stream and riparian areas that contribute to maintaining current populations of ESA-listed fish species on Federal lands within the NWFP area. "Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special S&Gs apply" (USDA and USDI 1994b, page B-12). "WA and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds." (USDA and USDI 1994b, page C-31). Riparian Reserve S&Gs are second in priority of all land allocations, (second only to Congressionally Reserved Areas); S&Gs for Riparian Reserves are added to those for the land allocations overlain by reserves ((USDA and USDI 1994b), page C-1).

In 1994, the preferred alternative for the NWFP incorporated "Riparian Reserve Scenario 1" into the ROD. This extended additional protections to aquatic resources on intermittent streams by expanding the widths in the associated Riparian Reserves. The resultant analysis in the FSEIS determined an 80% or higher likelihood of the NWFP attaining aquatic habitat of sufficient quality, distribution, and abundance on federal land for the seven salmonid races/species/groups evaluated. This increased probability resulted from reduced timber harvest with the wider prescribed Riparian Reserve widths on intermittent streams in Tier 2 Key Watersheds and non-Key Watersheds (FSEIS Chapter 3&4, page 198). It also reduced further risks to these streams from management-induced disturbances. The ROD identified 2,627,500 acres as Riparian Reserve under Scenario 1, which was estimated from Matrix lands only. Post- ROD, actual mapping of the riparian reserve system on many administrative units has led to an increase in acreage within the Riparian Reserve network (USDA and USDI 1997b section C, p. 4 and section E1a, p. 25; USDA and USDI 1999 p. 4.).

According to the ROD, the interim Riparian Reserve widths, (the initial default widths), are designed to provide a high level of fish and riparian protection until watershed and site-specific analysis can be completed. There has been limited adjustment of the interim Riparian Reserve widths established when the NWFP ROD was signed (details in Section 3.21 Implementation Monitoring). In addition, overall compliance with S&Gs has exceeded 95% based upon actions sampled for the period 1996-2001 across the NWFP area. The implementation monitoring for the period 1996-2001 for all S&Gs included those specific to actions within Riparian Reserves. One can conclude that this level of compliance strongly supports the attainment of ACS objectives since "Standards and Guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of ACS objectives." (USDA and USDI 1994b at B-12).

As explained earlier in the ACS objectives section, the FSEIS clarifies the spatial and temporal scales for which the Riparian Reserve S&Gs are designed to operate: "As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that may retard or prevent attainment of the Aquatic Conservation Strategy objectives *at the fifth-field watershed scale over the long term***."** (Emphasis added).

In summary, Riparian Reserves, as addressed above, are a major component of the ACS and are extremely important to the conservation of ESA-listed fish species. The entire current and historic ESA-listed fish species distribution on FS and BLM managed lands within the NWFP area is contained within Riparian Reserves, which contribute to ESA-listed fish species conservation by protecting the health of the aquatic system and its dependent species. Implementation monitoring reports for the period 1996-2001 indicate that projects are being designed and implemented consistent with S&Gs, and therefore are contributing towards attainment of ACS objectives. Attainment of ACS objectives is a benefit to ESA-listed fish species. In addition, the network of Riparian Reserves has only been minimally modified according to implementation monitoring reports. Therefore, the assumptions of the benefits to fish and aquatic resources based upon the extent of Riparian Reserves as originally envisioned remain valid. Riparian Reserves

will help maintain and restore riparian structures and functions to benefit fish species (USDA and USDI 1994b, page 7).

2) Key and Non-Key Watersheds

The proposed amendment would not change the numbers or distribution of Key and Non-Key watersheds in the NWFP area. The role of Key watersheds would not be changed. Key watersheds would continue to serve as refugia, providing (or are expected to provide) high quality habitat. Key watersheds would continue to be crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species, and remain highest priority for restoration.

Both Key and non-Key Watersheds contain ESA-listed fish species. Only in the Key Watersheds, roadless areas in non-Key Watersheds, and Riparian Reserves (in all watersheds) is a WA specifically required prior to management. In Key Watersheds and Riparian Reserves, WA is the process used to develop a baseline from which to assess maintaining or restoring the condition and provide context for project planning. Even without a completed WA, some form of analysis is necessary for project planning in all watersheds.

WA has been completed in a large majority of Key Watersheds across the NWFP area (Table 14). Nineteen of 25 BLM and FS administrative units reported 100% of their Key Watershed acreage had been covered by WA. Two administrative units had no Key Watersheds, two did not provide data, and six others reported 67-91% of their Key Watershed acreage had completed WA. Conservation of ESA-listed fish species on Federal lands requires a broad, landscape level appreciation of their current and historic distribution, and also their need for high quality, complex, and interconnected habitats at multiple scales. Information on the range of current and historic distribution of fish species is typically presented in WA.

Key Watersheds are intended to function as refugia. Currently, Key Watersheds are composed of areas with high quality aquatic and riparian conditions that will serve as anchors for the potential recovery of depressed stocks, and lower quality habitat areas that have the potential to become future sources of high quality habitat with the implementation of a comprehensive restoration program. Key Watersheds were not intended by the NWFP ROD to be, nor are they described therein, as a land allocation. Rather, Key Watersheds overlay other land allocations and provide additional S&Gs that are added to the S&Gs of the other allocations. The principal S&Gs that apply to Key Watersheds and may serve to add protection for ESA-listed fish species are those relating to roads (achieve a net reduction or no net increase in roads; no new roads in inventoried roadless areas within Key Watersheds), and the requirement to conduct WA prior to ground-disturbing management activities. The benefits of Key Watersheds accrue largely from being composed of relatively functional, (presently containing both high quality and degraded habitat), habitat areas and their overlap with major portions of relatively protective land allocations (e.g., LSRs, Congressionally Reserved Areas, and Administratively Withdrawn Areas). This interpretation is supported by a review of the

ROD (USDA and USDI 1994b), the FEMAT Report (USDA et al. 1993) and the FSEIS (USDA and USDI 1994a).

Management actions within Key Watersheds will be consistent with maintaining present or restoring future refugial conditions which is beneficial to ESA-listed fish species.. The Key Watershed network will provide, or is expected to provide over time, larger areas of high quality habitat and contribute to aquatic ecosystem integrity. Undoubtedly, a functional network of watershed scale refugia will contribute significantly to conservation of ESA-listed fish species.

Management activities can occur within Key Watersheds. As described above, WA (required prior to management activities, except minor activities such as those categorically excluded under NEPA) develops a baseline from which to assess maintaining or restoring the condition and provides context for the design and site-specific assessment of activities. Some short-term negative effects may occur to ESA-listed fish species as a result of implementing certain restoration activities in Key Watersheds. Long-term beneficial effects to ESA-listed fish species will occur with proper restoration techniques. See the watershed restoration discussion (below) for possible short- and long-term effects from watershed restoration.

The designation of Tier 1 and Tier 2 Key Watersheds further prioritizes management direction for watershed restoration. Tier 1 Key Watersheds are designated for anadromous fish and bull trout conservation; Tier 2 Key Watersheds are designated for contribution of high quality water to support a range of downstream beneficial uses. ESA-listed fish species are strongly associated with upstream sources of cool, high quality water, such as seeps, springs, and natural upwellings. Clear, cool water is needed for all life stages and especially during the spawning and rearing phases.

The reduction of existing system and non-system road mileage outside Roadless Areas is a S&G for Key Watersheds. Implementation monitoring reports for the years 1999, 2000 and 2001 evaluated the status of road mileage in Key Watersheds. The trend has been a reduction in total road miles in Key Watersheds.

Of seven Key Watersheds reviewed for the 1999 report, six had avoided road construction, six had reduced road mileage, and one had maintained road mileage. Of approximately 1861 system road miles existing in 1994, 84 miles had been decommissioned and 13.3 new miles had been constructed, a net reduction of 70.7 miles, at a ratio of 6.3 to 1. For non-system roads, 11.9 miles had been decommissioned while 10.9 miles had been constructed, for a net reduction of 1.0 mile (Regional Implementation Monitoring Team 1999).

There was a net reduction of 82.2 miles (4%) of system roads in 12 Key Watersheds reported in the 2000 implementation monitoring report (Regional Implementation Monitoring Team 2000). The ratio of miles of road decommissioned to miles of road constructed was 9.6 to 1 (91.8 miles to 9.6 miles). Information was not available for status of non-system roads in six of the Key Watersheds. A net reduction of 11.3 miles (5.9%) occurred in the other six Key Watersheds. The ratio of miles decommissioned to miles of road constructed was 2 to 1 (23 miles to 11.7 miles).

System road mileages were reduced by 195.4 miles (11%) in 12 Key Watersheds evaluated for the 2001 implementation monitoring report ((Regional Implementation Monitoring Team 2001). The ratio of miles of road decommissioned to miles of road constructed was 90 to 1 (197.7 miles to 2.2 miles). The 2001 implementation monitoring effort did not report on non-system road mileage status for the Key Watersheds.

The status of road mileage in the 31 Key Watersheds evaluated by the Regional Implementation Monitoring Team is likely representative of Key Watersheds throughout the NWFP area. There has been an aggressive effort to reduce road mileage by road obliteration and decommissioning, while new road construction has been extremely limited. Benefits to ESA-listed fish species occur when existing road networks are reduced in Key Watersheds, particularly when the road segments removed were formerly connected to stream channels. The potential for catastrophic introduction of sediment when a culvert becomes plugged and the road prism fails is reduced. The concentration of flows by road segments augmenting the stream network is reduced. Chronic sediment delivery from native surface roads, fill slopes and cut slopes is also reduced.

3) Watershed Analysis

The proposed amendment clarifies the use of WA. Formerly, a decision maker was directed to use the results of WA to support the finding that a proposed activity was consistent with the ACS objectives. (USDA and USDI 1994b at B-10). Current language may imply too simplistic a relationship between projects and attainment of ACS objectives by requiring a "finding of consistency" with ACS objectives for all projects. Projects must be considered in a watershed scale or broader context to determine whether potential effects to aquatic ecosystems are acceptable.

The ACS FSEIS (USDA and USDI in press) states: "Projects needed to achieve Northwest Forest Plan goals have been delayed or stopped due to misapplication of certain passages in the ACS." "This interpretation establishes an impossible expectation for demonstrating that a project follows the ACS (USDA and USDI in press)." Consequently, the proposed amendment clarifies that: "Projects should be designed to comply with applicable standards and guidelines in Sections C and D (and other relevant standards in Resource Management Plans). No further finding of ACS consistency is required." The ACS FSEIS also states that "No management activities can be expected to maintain the existing condition at all scales and at all times; disturbance from management activities must be considered in the context of the fifth-field watershed as a whole."

The proposed amendment emphasizes that relevant information from WA will be used to provide context for project planning. This does not imply that WA recommendations would be utilized as decisions, as the WA is not a decision making document. The information provided by the WA would help provide context and support for actions. This does not diminish the importance or value of WA. The Preferred Alternative (Alternative A) for the ACS FSEIS also defines the intent of S&Gs that reference ACS objectives. Interpretation and an example of application of this type of S&G is presented later in this section (6.1.1.1 ACS Components, Standards and Guidelines). WA will be a

primary source of information for determining if a proposed activity follows this type of RR S&G.

The proposed amendment also establishes a requirement to document how information from WA was used for project planning. "The project record will demonstrate how the agency used relevant information from applicable watershed analysis to provide context for project planning, recognizing that watershed analysis is not a decision-making process in and of itself, nor is a watershed analysis a decision document (USDA and USDI in press)." This requirement will be met in NEPA decision documents. Decision-makers are encouraged to be as specific as needed in the decision documents, explaining how the action is consistent with appropriate plans, starting with the applicable RMP and including subordinate plans. Since the ACS amended or is incorporated in FS and BLM RMPs, line officers will continue to ensure that projects are compliant with the ACS.

WA is not a decision-making document. The proposed amendment explicitly states "…recognizing that watershed analysis is not a decision-making process in and of itself, nor is a watershed analysis a decision document (USDA and USDI in press)." This statement supports an understanding about WA within the original NWFP ROD: "Watershed analysis will focus on collecting and compiling information within the watershed that is essential for making sound management decisions. It will be an analytical process, *not a decision-making process with a proposed action requiring NEPA documentation (emphasis added).*" (USDA and USDI 1994b), p. B-20).

The Federal Guide for Watershed Analysis (1995) discusses issues of scale and explains why the fifth-field watershed scale "satisfies many needs and offers a consistent format for reporting results of an analysis." The Federal Guide states that analysis at the watershed scale "provides the context for management through the description and understanding of specific ecosystem conditions and capabilities." All other requirements and uses of WA described on pages B-20 through B-30 of the ROD would remain unchanged with the proposed amendment. WA will continue to be: "…one of the principal analyses that will be used to meet the ecosystem management goals of these standards and guidelines." (USDA and USDI 1994b), p.E-20). WA is required, (with some exceptions for minor activities), in Key Watersheds, remaining undeveloped portions of roadless areas in non-Key Watersheds, and in Riparian Reserves prior to determining how proposed land management activities meet ACS objectives. The Federal Guide for WA (USDA et al. 1995) outlines a six-step process and suggests that teams planning to conduct a WA review both the analysis overview and each of the six steps. Modules or techniques to gather data for synthesis with other team members and the final report are optional. Examples of modules that may be used are the Washington State Timber Fish and Wildlife (TFW) WA modules, erosion and hydrology modules, physical stream habitat and aquatic species viability modules, and the Riparian Reserve module (discussed above under Riparian Reserves). WA is assisting the FS and BLM focus on an ecosystem approach to land and water management, which will likely have beneficial effects to ESA-listed fish species.

A large proportion of the land area encompassed by the NWFP has been assessed using WA, thereby providing a context for management decisions in light of the ACS. Of the 27 BLM and FS administrative units reporting WA completion for land area administered under the NWFP in Table 14, 20 report more than 80% of land area assessed by WA, 14 report greater than 90%, and seven report 100%. WA results and recommendations are intended to focus on the goal of maintaining and restoring whole aquatic ecosystems. However, implementing recommendations resulting from WA is discretionary and part of the NEPA decision-making process. Generally, use of a detailed WA for decision-making is beneficial for ESA-listed fish species. It provides information useful for establishing the environmental baseline used in Section 7 consultations and also forms the basis for project design that is consistent with the ACS.

4) Watershed Restoration

The proposed amendment does not change any aspect of watershed restoration under the ACS.
The proposed amendment is designed to increase agency success in planning and implementing projects that follow NWFP principles, including watershed restoration. Watershed restoration relies on WA and planning to identify restoration activities with the greatest likelihood of success.

Watershed restoration is occurring in many watersheds, has been focused in Key Watersheds, and overall represents a benefit to ESA-listed fish species. The BLM and FS have invested millions of dollars since the inception of the NWFP in watershed restoration actions. Fish habitat has been restored directly or indirectly by: 1) Reducing sediment and improving flow regimes by decommissioning roads, erosion control, and upgrading sizes of culverts; 2) Improving instream fish habitat complexity; 3) Improving fish passage at road crossings; and, 4) Restoring riparian vegetation functions by planting, seeding and thinning riparian areas. Table 13 displays a compilation of watershed restoration accomplishments by FS and BLM administrative units.

A particular focus of watershed restoration has been the reduction of road mileage. The status of road mileage for Key Watersheds examined in the 1999 to 2001 NWFP implementation monitoring efforts was described in the Key Watersheds section of this BA. Table 13 displays a total of 1,770 miles of road decommissioning for all administrative units in the NWFP area for differing time periods. This includes Key and non-Key watersheds. Table 15 displays status of road mileage by administrative units across the NWFP area. While the majority of administrative units exhibit a net reduction for road mileage, this is confounded by the fact that the outcome of initiatives to validate management jurisdiction of road segments is also included in the net totals. Consequently, the numbers in Table 15 are the net outcome of the miles of road decommissioned, small increases in miles of road constructed, and changes in management jurisdiction for road mileage between the BLM, FS, counties, states and others.

Some short-term adverse effects such as increased turbidity or streambed sedimentation may accrue from restoration activities such as culvert removal and replacement, road obliteration, and activities occurring within the active stream channel or Riparian Reserves. However, these actions should provide a long-term benefit for ESA-listed fish species.

5) ACS Monitoring

The proposed amendment does not change any aspect of ACS monitoring. Monitoring programs will continue. Implementation, effectiveness, and validation monitoring are and will be conducted to determine effectiveness of management practices, validate assumptions of the NWFP, and to evaluate the success of the NWFP in restoring and maintaining aquatic and riparian ecosystems to desired conditions within the NWFP area. Monitoring provides a feed-back loop to fuel adaptive management necessary to insure compliance with the ACS and proper implementation of the NWFP. Effectiveness monitoring is critical to evaluate the effects of implementing land management actions under the NWFP and ACS. Analysis of effectiveness monitoring results in an adaptive management framework may result in modifying future actions and components of the ACS. The outcome may further avoid or minimize negative management impacts on ESA-listed fish species and their habitat.

Implementation monitoring conducted by the REO from 1995 to present has determined that there has been a greater than 95 percent compliance rate with S&Gs for land management activities. This indicates that BLM and FS administrative units have a good understanding of the S&Gs and their use in project design. As a consequence, potential adverse effects to ESA-listed fish from land management actions are being reduced.

The AREMP project has not been in place for a sufficient time as an effectiveness monitoring program to detect trends in watershed conditions across the NWFP area. In the first two years of the program the focus was on logistical and sampling issues. The pre-pilot effort in 2000 developed and evaluated the organizational structure needed to operate the module; tested and compared procedures and sampling designs with subwatersheds as recommended by interagency expert teams; and developed cost estimates for implementation (Moyer et al. 2001). The pilot effort in 2001 evaluated logistical, sampling, and quality control issues, and created a decision support model to evaluate the condition of individual sample reaches and watersheds.

6) Standards and Guidelines

Implementation of S&Gs is crucial towards attaining the goals of the ACS. The most extensive set of S&Gs in the ACS is associated with Riparian Reserves, which encompass all of the habitat for the present and historic distribution of ESA-listed fish species. "As a general rule, S&Gs for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the ACS objectives." (USDA and USDI 1994b, page C-31). The ACS FSEIS adds to this sentence to clarify the appropriate temporal and spatial scales: "As a general rule, S&Gs for Riparian Reserves

prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the ACS objectives at the 5th field watershed scale over the long term."

The NWFP ROD states in several places that the Riparian Reserve S&Gs are "necessary to meet" the ACS objectives or are designed "to meet" the objectives. Consequently, compliance with Riparian Reserve S&Gs (which are a subset of all NWFP S&Gs) provides a measure of assurance that a project is consistent with the ACS. The FSEIS (USDA and USDI in press) states: "Projects should be designed to comply with applicable standards and guidelines in Sections C and D (and other applicable standards in Resource Management Plans). No further finding of ACS consistency is required."

S&Gs strongly influence the design and application of management actions within the Riparian Reserves to conserve riparian-dependent resources, including ESA-listed fish species and their habitat. The Riparian Reserve S&Gs are defined by type of land management activity and are generally prescriptive. The Preferred Alternative (Alternative A) for the ACS FSEIS defines the intent of S&Gs that reference ACS objectives: "To comply with Riparian Reserve Standards and Guidelines that reference ACS objectives, the decision maker must complete an analysis that includes a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given 5th field watershed, and how the project or management action maintains the existing condition or restores it toward that range of natural variability." WA and other sources will provide the information necessary to complete these analyses. The Federal Guide for Watershed Analysis (USDA et al. 1995) discusses range of natural variability on page 20. Relevant information for management activities with the potential to affect habitat for ESA-listed fish species includes baseline conditions and trends for watershed processes and habitat.

Consequently, those S&Gs that direct one to use perform such an analysis mean:

1) Develop a proposed action or evaluate an ongoing action in the context of an understanding of conditions and trends for watershed processes and habitat at the scale of a watershed: and, 2) incorporate an understanding of the RNV for the watershed processes and habitat.

An example is illustrative. GM-1 reads: "Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy Objectives. If adjusting practices is not effective, eliminate grazing." Under the proposed amendment, one is directed to use relevant information from the applicable WA to provide context for project planning. Other sources would be used to supplement WA information if needed. Relevant information for important physical and biological components of a given 5th field watershed in this case (for grazing allotments which include riparian areas) may include the baseline conditions and trends for riparian vegetation, bank stability, proportion of fine sediment in streambeds, water temperature, and width-to-depth ratio at the scale of the watershed, as well as the RNV for those watershed processes/habitat elements. Information on the distribution of fish species and locations of particularly important habitat areas is also relevant. This information, along with monitoring results,

would provide a context for determining whether or not grazing practices should be adjusted or eliminated. If the action, at the site scale, impacted the conditions at the watershed or larger scales, so they were not operating within or moving toward the range of natural variability, or key indicators (i.e. width-to-depth ratio) could not be maintained at the watershed scale with implementation of the action, it would be modified or eliminated.

In addition to S&Gs for Riparian Reserves, S&Gs are described in Sections C and D of the NWFP ROD (USDA and USDI 1994b) for Key Watersheds, Designated Areas and Matrix, Late-Successional Reserves, Adaptive Management Areas, Managed Late-Successional Areas, and Administratively Withdrawn Areas. While not all of the S&Gs are aimed at protecting riparian-dependent resources, some of those that largely target conservation of terrestrial habitat will indirectly benefit riparian-dependent resources. For example, in LSRs, no harvest is allowed in stands over 80 years old west of the Cascades (110 years in the Northern Coast Adaptive Management Area) (USDA and USDI 1994b at C-12) and road construction is not recommended unless potential benefits exceed the costs of habitat impairment (C-16). This will result in fewer ground disturbing activities and their potential effects.

WA and the S&Gs for Key Watersheds are important to accomplish the ACS objectives. WA is required in Key Watersheds and all roadless areas prior to resource management. It is also required to change Riparian Reserve widths in all watersheds (USDA and USDI 1994b at C-12). S&Gs for Key Watersheds are displayed on page C-7 of the NWFP ROD. There are five S&GS for Key Watersheds and each of them provides potential benefits for conservation of ESA-listed fish species and their habitat: 1) New roads are prohibited in remaining unroaded portions of inventoried (RARE II) roadless areas. This will reduce the potential flow and sediment effects from road construction; 2) Existing road mileage is expected to be reduced outside roadless areas. If funding is insufficient, there will be no net increase in roads in Key Watersheds. This will reduce negative effects of existing roads on the landscape to water quality; 3) Key Watersheds are highest priority for watershed restoration. This focuses funding resources for restoration of aquatic and riparian habitat in these refugia areas; 4) As described above, WA is required prior to management activities, except minor activities such as those categorically excluded under NEPA (but not including timber harvest); and, 5) WA is required before timber harvest. The last two S&Gs require an understanding of baseline conditions and trends for watershed processes and habitat conditions before designing actions in Key Watersheds. This will generally result in projects designed to be protective of aquatic habitat.

In summary, the implementation of S&Gs, particularly those for Riparian Reserves, Key Watersheds, and Watershed Analysis, are beneficial to ESA-listed fish species and critical habitat by providing guidance for the design, prioritization, and implementation of actions with the potential to affect riparian-dependent resources.

7) Land Allocations and Habitat for ESA-Listed Fish Species

The land allocations result in approximately 80% of federal lands in some form of reserve status across the NWFP area where land management actions are prohibited or strictly regulated. This provides benefits to ESA-listed fish species by minimizing the amount of ground-disturbing activities and potential adverse impacts to water quality and fish habitat. Please see text in section 6.1.1.1 for a description of how implementation of the components of the NWFP, including the ACS and land allocations, interact over time to restore aquatic and riparian habitat conditions and processes.

The Riparian Reserves land allocation was determined for the NWFP FEIS through a series of samples in the NWFP provincial areas (USDA and USDI 1994a). These samples were taken only in the Matrix land allocation area and resulted in an estimated 39% of the NFP Matrix lands being comprised of Riparian Reserves. Using this series of samples, it is estimated the other NFP land allocations within the Olympic Peninsula, WA Western Cascades, OR Western Cascades, WA Eastern Cascades and OR Eastern Cascades physiographic provinces are comprised of an average of 46%, 35%, 27%, 31%, and 15% Riparian Reserves, respectively (USDA and USDI 1999). However, FS and BLM analyses of Riparian Reserve land allocations have determined the NWFP FEIS underestimated the Riparian Reserve area of some provinces, especially the OR and WA Coastal areas, by as much as 74 % (USDA and USDI 1999, USDA and USDI 1997a, USDA and USDI 1997b).

Specific to habitat for bull trout, the majority of the FS and BLM lands pose a low or no potential for adverse effects. The FWS bull trout BO for the RMPs (USDI 2000) identified the following land allocations as low or no risk to bull trout: Congressionally Reserved, Administratively Withdrawn, and LSRs in Key Watersheds. These three land allocation areas encompass 64%, 77% and 84% of occupied habitat for the Columbia, Klamath and Puget Sound/WA Coast bull trout DPSs, respectively (USDI 2000). All other land allocations were identified as a moderate potential for adverse effects except for Riparian Reserves. However, the BO does not account for the Riparian Reserves of those land allocations since the Riparian Reserves were not mapped for the NWFP FSEIS.

Accounting for the Riparian Reserves would substantially reduce the FS and BLM land area identified by the FWS BO as posing a potential moderate risk to bull trout and their habitat. Using the average value of 39% Riparian Reserves for Matrix lands (USDA and USDI 1994a) and applying that to the percentage of all of the land allocations described in the 2000 bull trout BO as posing a moderate risk to bull trout, the result is approximately 22%, 14% and 10% of the land area posing a moderate risk to bull trout in the Columbia, Klamath and Puget Sound/WA Coast bull trout DPSs, respectively.

The NOAAF did not ascribe risk ratings to anadromous fish by land allocations in their Plan-level BOs and COs. The FS and BLM believe that the land allocations where most of the potential ground-disturbing actions may occur include Matrix, Adaptive Management Areas, and Managed Late-Successional areas. An assessment can be made for these land allocations for the anadromous fish ESUs with land allocation information displayed in the 1997 plan-level BA for Oregon and Washington BLM and FS

administrative units (USDA and USDI 1997b). The sum of the three land allocations, when adjusted to represent Riparian Reserves that overlay them at 39% have the following outcome: 26.1% of the land area in the Lower Columbia River steelhead ESU; 23.5% of the land area in the Middle Columbia River steelhead ESU; 14.6% of the Upper Columbia River steelhead ESU; 25.5% of the Lower Columbia River/Southwest Washington Coho salmon ESU; and 6.8% of the Puget Sound/Straight of Georgia Coho salmon ESU. This range of percentages (6.8 to 25.5) are likely representative of anadromous fish ESUs elsewhere in the NWFP area.

Actions implemented under the RMPs

The FS and BLM administrative units implement many of the same land-use practices, but the levels of activities and outputs vary depending on local circumstances. Although RMPs set important parameters for the authorization of specific projects, with some exceptions, RMPs do not provide the final authorization for project implementation. Final authorization of projects depends on the analysis of site-specific effects and consistency with appropriate management direction and legal requirements.

Because such a wide variety of activities and projects are directed by the amended RMPs, and many of these require interdisciplinary (ID) team development, WA, review pursuant to the National Forest Management Act (NFMA) and National Environmental Policy Act (NEPA) and other analysis and documentation before they can proceed, the FS and BLM cannot evaluate the effects of individual projects in this BA. Individual projects that may affect ESA-listed fish species are subject to ESA section 7 consultation requirements, and will be addressed in ESA consultations at the time such actions are proposed.

It is not anticipated that the proposed amendment will result in changes to the design of actions under the RMPs. The design of projects has been and will continue to be driven by the goals of the NWFP and shaped by land allocations, S&Gs, relevant information from WA, NEPA analysis, site-specific Best Management Practices, and the results of the streamlining consultation process during ESA consultation. Decision makers will continue to document that projects are consistent with RMPs and therefore the ACS of the NWFP that is integrated in the RMPs. Project implementation will continue to be in accordance with NEPA decisions and, where formal ESA consultation is required, with the terms and conditions of BOs. Monitoring will continue to evaluate whether or not projects were implemented as designed, in accordance with S&Gs and with contract specifications, and whether or not they are effective in meeting project goals.

A wide range of activities may take place when RMPs are implemented. Some of the actions may negatively affect ESA-listed fish species or critical habitat. These effects are typically short-term, transitory and localized, because implementation of the ACS, including land allocations, S&Gs, project-specific BMPs, and project planning in the context provided by WA, result in project designs which are consistent with maintaining or restoring ecological processes at the 5th field watershed scale over the long term. Other actions, such as watershed restoration, will directly or indirectly have beneficial effects to ESA-listed fish and their habitat.

Another element of the NWFP and ACS affecting ESA-listed fish and their habitat are the beneficial indirect effects of land allocations and standards and guidelines within established reserves. Riparian Reserves, Late Successional Reserves and their accompanying S&Gs limit the size and scope of vegetation management activities and road construction which can occur within them. Consequently, natural processes associated with vegetation re-growth in areas previously disturbed by human activities or natural events provide benefits to habitat of ESA-listed fish species by: 1) Creating increased shade canopy over streams; 2) Reducing erosion; 3) Providing future large woody debris; 4) Building stream channel sinuosity and complex instream habitat; and 5) Buffering sediment delivery from upslope sources. In areas in good condition within the reserves, high quality habitat is maintained.

Effects of Individual and Groups of Actions

A general overview of potential effects to ESA-listed fish species or their critical habitat associated with actions which may be implemented under the RMPs follows. As individual projects are designed they will receive site-specific analyses to determine the extent of the environmental impacts and the effects on proposed or listed species and their habitat. Whenever possible, it is anticipated that the effects will be reduced because the actions will be designed and mitigated in accordance with the NWFP land allocations and the ACS, including S&Gs, incorporating site-specific Best Management Practices, and using relevant information from WA. The NOAAF identified the specific benefits of the NWFP for providing short-term protection and long-term recovery of aquatic habitats (USDC 1997b, USDC 1996b).

Watershed Restoration. Watershed restoration activities may have short-term adverse effects on salmonids and their habitats, however the long-term effects should be beneficial (USDC 1997b). The primary potential negative effect of culvert replacements and road decommissioning is a short-term increase in fine sediment and turbidity to streams. Turbidity dissipates quickly once construction is completed for culvert replacements. Turbidity may increase with rainfall events during the first winter, depending upon vegetation regrowth and effectiveness of mulching at culvert replacement sites and decommissioned road segments. Fine sediment introduced by project activities is evident in stream channels for short distances downstream, but usually is moved downstream as bedload and becomes undetectable in stream channel substrate after the first winter of storm flows.

Benefits realized from replacement or upgrading of culverts at stream crossings include restoration of passage for fish, flood flows and bedload (USDC 1997b). Road decommissioning is perhaps the most beneficial action for long-term restoration of aquatic habitats (USDC 1997b). Regarding instream habitat enhancement structures, the NOAAF agrees with fishery scientists who concluded that the benefits of these projects are usually short-term in effect, though they may be appropriate for limited use to augment longer-term riparian rehabilitation and sediment source reduction (USDC 1997b

and USDC 1996a). The NWFP (page B-32) states that instream restoration will be accompanied by riparian and upslope restoration if watershed restoration is to be successful. Also, the S&Gs for riparian reserves (NWFP, pg. C-37, WR-3) indicate that mitigation or planned restoration cannot substitute for preventing habitat degradation. Additional S&Gs for restoration activities in Riparian Reserves are also in the NWFP ROD (WR-1, FW-1, p. C-37) (USDA and USDI 1994b). Actions described above may also cause minor, short-term degrading impacts on instream habitat. Work within stream channels associated with these actions may be considered to have a reasonable certainty of incidental take should any ESA-listed fish species be present. Depending on the association between project site disturbance and downstream fish habitat, resulting short-term fine sediment pulses may adversely affect the survival of some fish life stages.

Forest management. Forest management includes all activities associated with the access, removal, and re-establishment of forest vegetation, including road construction, timber harvest site preparation, planting, and intermediate silvicultural treatments. The effects of timber harvest and forest roads on salmonids and their habitat have been documented in Meehan (1991), Spence et al. (1996), USDC (1997a), and USDC (1997b). Timber harvest has the potential to reduce streamside canopy levels which may result in increased stream temperatures and reduce the supply of large woody debris; alter stream flow regime; and accelerate surface erosion and mass wasting causing increased sediment delivery and turbidity in streams.

However, the literature reviews relate the results of studies of timber harvest activities not designed in the context of the NWFP. Many of the studies referenced are based upon regeneration cuts on 50 to 90 percent or greater of the land area in watersheds in short time frames, with relatively narrow riparian buffers. These circumstances are not typical of NWFP timber harvest actions.

Timber harvest and road construction activities in the NWFP area are designed to comply with Standards and Guidelines in applicable RMPs, are focused primarily in the Matrix land allocation upslope from wide Riparian Reserves, and have limited entry into Riparian Reserves. Unstable land areas prone to mass wasting are identified in WA and during NEPA analyses and often are added to Riparian Reserve no-harvest buffers or simply avoided and not logged. “Riparian Reserve widths on all permanently-flowing streams are wide enough to provide a full array of ecological functions by including the floodplain, inner gorges, and unstable and potentially unstable lands within the reserves.” (FSEIS, Vol. 1, p. 3&4-68). The limited new road construction that takes place for timber sales in the NWFP area avoids connecting new road segments to stream channels to the extent possible, and often obliterates new temporary road segments in the same dry season as when they are constructed.

The design, location and timing of federal timber sales planned in accordance with the NWFP and its ACS, as well as other laws and management direction, will minimize the potential to: 1) Reduce stream shade canopy to the extent that water temperatures are measurably increased; 2) Reduce the supply of large wood debris; 3) Alter stream flow

regimes; and, 4) Accelerate surface erosion and mass wasting to the extent that there is increased sediment delivery and turbidity in streams.

S&Gs for Key Watersheds do not allow timber harvest to occur until watershed analyses have been completed ((USDA and USDI 1994b), p C-7). S&Gs for Riparian Reserves allow salvage after catastrophic events, other silvicultural practices, and firewood cutting only in circumstances where those actions are needed to attain ACS objectives ((USDA and USDI 1994b), p C-32). Salvaging of trees is only allowed when WA determines that present and future coarse woody debris needs are met and other ACS objectives are not adversely affected ((USDA and USDI 1994b), p C-32).

For purposes of this analysis, it is assumed that implementation will occur at the rate and scale projected when the original ROD was signed in 1994, keeping in mind that the PSQ was reduced by approximately 19% beginning in 2001 (Figure 4). Hence, with adjustments, a scheduled timber harvest program, including regeneration harvest, of about 805 mmbf can be anticipated.

If implementation of Preferred Alternative A results in increased vegetation management and watershed restoration activities, the potential for negative short-term, site-level impacts would increase proportionately to the amount of work implemented. Predicted effects are described in the NWFP FSEIS. Federal land managers evaluate these effects project-by-project and cumulatively, and include mitigation measures to reduce the risk of adverse effects from projects. These potential effects are also evaluated at a programmatic level within RMPs.

The extent to which these potential environmental impacts may rise to the level of a "May Affect, Likely to Adversely Affect" determination for ESA-listed fish species, is dependent upon specific site and watershed characteristics for a proposed action and the design of the action itself. This will be determined in project-level Section 7 consultations. Not all environmental impacts result in adverse effects to ESA-listed species or their designated critical habitat.

West of the Cascade Range, harvest will not occur in Late-Successional Reserves in stands that are over 80 years of age (110 years in the Northern Coast Adaptive Management Area) ((USDA and USDI 1994b), p. C-12). East of the Cascades and in the Oregon and California Klamath Provinces, additional management activities are allowed in Late-Successional Reserves to reduce risks of large-scale disturbance, such as fire. "Silvicultural activities aimed at reducing risk shall focus on younger stands in Late-Successional Reserves." ((USDA and USDI 1994b), p. C-13). "While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will result in greater assurance of long-term maintenance of habitat, (2) the activities are clearly needed to reduce risks, and (3) the activities will not prevent the Late-Successional Reserves from playing an effective role in the objectives for which they were established." ((USDA and USDI 1994b), p. C-13).

No scheduled timber harvest will occur in Riparian Reserves ((USDA and USDI 1994b), TM-1, p. C-31) and in Matrix lands where there is little late-successional forest remaining. However, some timber volume is anticipated to be produced by thinning actions within Riparian Reserves, Late Succesional Reserves, and other NWFP non-timber base lands for watershed and terrestrial restoration purposes (accelerating late-successional characteristics) and for research and adaptive management purposes. Late-successional patches should be retained in fifth field watersheds where the federal forest lands are currently comprised of 15% or less late-successional forest ((USDA and USDI 1994b), p. C-44).

The construction, use and maintenance of forest roads have been shown to be a primary source of sediment impacts in developed watersheds. Roads can alter both subsurface and surface water flows which, in turn, may alter both peak and base stream flows (USDC 1997a, Jones and Grant 1996). However, road construction in recent years has been much reduced, and road segments are usually constructed without hydrologic connectivity to stream channels. The effects of road construction are reduced by the S&Gs. No new roads should be built in Roadless Areas in Key Watersheds, and outside of Roadless Areas there should be a reduction in road mileage or, if there is inadequate funding to reduce mileage, there should be no net increase in mileage ((USDA and USDI 1994b), p C-7). Implementation monitoring reports have identified reductions in road mileages within Key watersheds (Table 11 and Table 12). A more detailed description of status of road mileage within Key Watersheds is found in the Key Watershed section earlier in this document. S&Gs for road management in Riparian Reserves are identified in the ROD (RF-1 to RF-7; p. C-32, 33) (USDA and USDI 1994b).

In summary, analysis of the proposed ACS amendment assumes that scheduled timber harvest will increase above levels of recent years, but will remain less than the Probable Sale Quantity (PSQ) evaluated in the 1994 ROD (958 to 805 mmbf). There is an anticipated concomitant increase in watershed restoration activities. When conducting forest management and watershed restoration activities, there may be an increase in the potential for short-term adverse affects to ESA-listed fish species, but these effects are still within the original scope analyzed in earlier plan-level ESA consultations. There is also the potential for an increase in long-term benefits since restoration will be implemented at levels originally described in the NWFP.

Plantation maintenance and release. Plantation maintenance and release practices generally have little immediate impact on aquatic resources (USDI 1989) and in the long-term should be beneficial as the remaining trees grow more quickly to a larger size. The effects of fertilization and chemical treatments to control competing vegetation are discussed in Meehan (1991) and Spence et al. (1996). S&Gs for silvicultural treatments in Riparian Reserves are identified in the ROD (TM-1, p. C-31; RA-3, p. C-37) (USDA and USDI 1994b).

Recreation. Recreation use can affect salmonid habitat in several ways: 1) upland changes in soils and vegetation that may affect runoff and erosion, 2) riparian changes that influence erosion, cover, food resources, and water quality, and 3) instream changes

that affect stream morphology, water quality, streamflow, substrate and debris. Direct recreational effects on fish occur primarily through angling (a use that is not funded, authorized or issued permits under BLM or FS authorities). Campground and trail maintenance and construction may increase access to fish habitats and affect the distribution of recreational use Meehan (1991). S&Gs for recreation management in Riparian Reserves are identified in the ROD (RM-1, RM-2, p. C-34) (USDA and USDI 1994b). Additionally, the S&Gs for recreation uses and developments in Late-Successional Reserves afford additional protections to watersheds ((USDA and USDI 1994b), p. C-17, 18). In summary, there is the potential for adverse affects to ESA-listed fish species by recreation activities.

Livestock grazing. The potential effects of livestock grazing on salmonids and their habitats are
discussed in Meehan (1991), Spence et al. (1996), Chaney et al. (1990), and Clary and Webster (1989). Livestock grazing can have both acute and chronic effects. Acute effects are those which contribute to the immediate loss of incubating embryos and/or fish and loss of specific habitat features or localized reductions in habitat quality. Chronic effects are those which, over time, result in widespread reductions in habitat quantity and/or quality or loss of entire fish populations (for further discussion see Meehan (1991) and USDC (1997b). S&Gs for grazing management in Riparian Reserves are identified in the ROD (GM-1, GM-2, GM-3, p. C-33, 34) (USDA and USDI 1994b). "Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy Objectives. If adjusting practices is not effective, eliminate grazing." (GM-1, p. C-33). These three S&Gs are subject to the analysis process described in the ACS FSEIS for RR S&Gs that reference ACS objectives (Section 6.1.1.1 (ACS components, 1) Riparian Reserves).

Mining. The potential effects of mining activities on salmonids and their habitats are discussed in Meehan (1991), Spence et al. (1996), and USDC (1997b). Potential effects include chemical contamination of water, direct disturbance by operating within stream channels, physical alteration of stream banks and streambeds, loss of riparian vegetation from excavation, and sediment and flow consequences from road construction and development of road networks. Consistent with mining regulations, S&Gs in the ROD (MM-1 to MM-6, p.C-34-35) are used to reduce impacts of mining operations in Riparian Reserves (USDA and USDI 1994b).

Riparian silviculture. Riparian silvicultural treatments include planting conifer trees in riparian areas dominated by hardwood and brush species. Small openings may need to be created in both the overstory and understory vegetation to allow the conifers to grow. There is a slight potential for fine sediments to get into streams from disturbances in these openings as well as a slight potential for increased air temperatures in the riparian area which may affect water temperatures. In the long-term, planted conifers should provide a source for large woody debris.

Surveys. The primary effect of conducting surveys in or near stream channels is disturbance to adult and/or juvenile fish and a potential for trampling on incubating

embryos in the gravels. Sampling techniques like smolt traps and electro-fishing may result in injury or death to individual fish. Falling and topping of wildlife trees may have slight effects on the long-term input of large wood into channels.

Wildfire suppression. Ground disturbing activities associated with the suppression of wildfire may result in an increase in sediment delivery to streams. The use of chemical fire retardants is important for the suppression of wildfires. The effects of fire retardants on salmonids are discussed in Meehan (1991) and Spence et al. (1996). The use of prescribed fire may result in an increase of nutrients and fine sediment in to streams (Spence 1996), and there is a potential for prescribed fire to kill streamside vegetation. The construction and use of pump chances has the potential to delivery fine sediment and chemicals (oil and gasoline) into streams, and the use of unscreened pump equipment has a slight potential to kill fish. S&Gs for fuels and wildfire management in Riparian Reserves are identified in the ROD (FM-1 to FM-5, RA-4, p. C-35 to C-37) (USDA and USDI 1994b).

Land exchanges and acquisitions. Land exchanges and acquisitions have no direct impact on salmonids or their habitat. The newly acquired federal lands will be managed under the land allocations and S&Gs of the NWFP which will likely provide greater protections for salmonid habitat on these lands than if they had remained in non-federal ownership. However, acquisitions, exchanges and conservation easements should be used to meet ACS objectives and facilitate the restoration of fish stocks (USDA and USDI 1994b), LH-5, p. C-37). Conversely, federal lands which are exchanged will likely be managed with fewer protections to fish habitat than if they had remained in federal ownership.

Special forest products. The harvesting of special forest products, i.e., mushrooms, mosses, etc., generally would have no effect on salmonids or their habitats. However, the role these species play in riparian forests is poorly understood. One forest product, firewood cutting, has the potential to reduce large woody debris in riparian areas. However, S&Gs only allow firewood cutting when those activities are needed to attain ACS objectives (USDA and USDI 1994b at C-32).

Special use permits. The effects of kinds of activities which are authorized under special use permits are highly variable due to the range of disturbance associated with the individual actions. Spence et al (1996) discuss the effects of hydropower projects and water withdrawal projects. Power line and utility corridors have the potential to increase sediment delivery, reduce the input of large woody debris, and may be sources of chemical contamination (herbicides) to streams. Hauling on federal roads (road use permits) and construction of roads under right-of-ways can increase the delivery of fine sediments from roads into streams (Meehan 1991 and Spence et al. 1996). S&Gs for the management of special use activities in Riparian Reserves are identified in the ROD (LH-1 to LH-3, LH-4, RA-1, p. C-36, 37) (USDA and USDI 1994b).

Three Additional Areas with Special Circumstances

Mendocino NF

Since the ACS applies to the Red Bluff Recreation Area, the effects of the Preferred Alternative (Alternative A) should be similar to those described above. The most intensive use of the area that could affect listed salmonid species occurs during occasional boat races and water skiing events. Consultation with NOAAF on the special use permit for these events determined that the activities were LAA but not likely to jeopardize the continued existence of Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, and Central Valley steelhead ESUs (USDC 2000a). Terms and conditions issued with the BO included monitoring requirements for detection of incidental take and adverse modification to designated critical habitat. Historic and recent data collected for 3 years indicated that the events have not had a significant detectable effect on the movement or distribution of adult or juvenile salmonids within the area over the years. NOAAF recently amended its BO by removing the monitoring requirements in a letter dated 4-14-2003(USDC 2003).

Wenatchee NF

The Wenatchee NF has been and will continue to use the NWFP ACS, specifically the S&Gs for the Riparian Reserves and WA, to guide management of areas outside the NWFP area. Since these lands are very dry and have no habitat for the listed fish species, it is unlikely that other components of the NWFP such as Key Watershed designation would be applied to these lands. The restoration component of the NWFP applies to these areas but generally such activities would be a low priority unless it indirectly contributed to the restoration of Key Watersheds designated by the NWFP or the conservation of listed fish species.

BAs using the Matrix of Pathways and Indicators for anadromous fish and/or bull trout have been completed for all project level actions. Most activities have been determined to have no affect to any of the listed species but a few actions have been determined to may affect but not likely to adversely affect the listed fish species. All actions in these areas potentially affecting the listed species will continue to be assessed by the Forest and reviewed by the interagency level 1 teams.

Coquille Forest

When legislation in 1996 created the new Coquille Forest it included a requirement that management of the Coquille Forest lands will be subject to the standards and guidelines of Federal Forest plans on adjacent or nearby Federal lands, now and in the future. The adjacent Federal lands are Coos Bay BLM District lands. The effects of continued implementation of the Coos Bay District RMP, which incorporates the Northwest Forest Plan and the ACS, on Oregon coast coho salmon were described in a BA in 1997 (USDA

and USDI 1997). The analysis in that BA included the land area encompassed by the Coquille Forest. The BO regarding the effects of the Coos Bay RMP on listed Oregon coast coho salmon concluded non-jeopardy (USDC 1997b). The effects of the proposed ACS amendment and continued implementation of the Coos Bay District RMP under the proposed ACS amendment on Oregon coast coho are described in Section 6.1. Because the Coquille Forest will be managed subject to standards and guidelines of Federal Forest plans on adjacent or nearby Federal lands, the descriptions of effects and conclusions of effect on listed Oregon coast coho salmon for the Coquille Forest are identical to those for the Coos Bay District RMP.

Effects to Designated or Proposed Critical Habitat

The effects of the continued implementation of the RMPs as amended by the proposed ACS amendment to the designated or proposed critical habitat are described and analyzed in detail for critical habitat not previously addressed in biological opinions for the RMPs. Designated or proposed critical habitat are identified by administrative unit and species in Table 2. Designated critical habitat for the Central California Coast and Southern Oregon/Northern California Coast coho salmon ESUs was previously assessed and addressed by NOAAF BOs and are hereby incorporated by reference (USDC 1999, USDC 2001). Effects common to all critical habitat are discussed in section 6.2.1. Effects specific to the proposed critical habitat for the Columbia River and Klamath River bull trout DPSs are discussed in section 6.2.2. Critical Habitat has been designated for 6 anadromous fish ESUs (Table 1) and are primarily addressed in the "Effects Common to all Critical Habitat" section rather than individually in section 6.2.3.

Effects Common to All Critical Habitat

The NWFP ACS was designed to incorporate all elements of the aquatic and riparian ecosystem necessary to maintain the natural disturbance regime. These elements include maintenance of hydrologic function, high water quality, adequate amounts of coarse woody debris, complex stream channels that provide a diversity of aquatic habitats types, and riparian areas with suitable microclimate and vegetation. The ACS created a connected system of aquatic and riparian habitats throughout the NWFP area. The ACS, in particular the Riparian Reserves, has reversed the trend of aquatic and riparian habitat degradation and began the recovery of these habitats.

The FSEIS for the NWFP described attributes important to aquatic ecosystems (USDA and USDI, 1994a). A description of the function of habitat components, hydrology, water quality, riparian and coarse woody debris are discussed in detail on pages 51-63 of chapters 3 and 4. The FEIS assessment did not explicitly rate the abundance and ecological diversity of habitat, ecosystem processes and functions and the connectivity of the aquatic habitat. It did consider ecosystem processes and functions represented by the Riparian Reserve widths, Key watersheds and watershed restoration. Connectivity

represented by Riparian Reserves and supported by the other adjacent land allocations was considered as well.

The proposed or designated adfluvial or fluvial critical habitat on FS and BLM lands lies entirely within the Riparian Reserve land allocation. The Riparian Reserve prescription for reservoirs, lakes and fish bearing streams is:

Constructed ponds and reservoirs, and wetlands greater than 1 acre - Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.

Lakes and natural ponds - Riparian Reserves consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

Fish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

The Riparian Reserve prescription for fish bearing streams, which are the most protective for streams, would apply to all fluvial critical habitat. Given this prescription for fish bearing streams, the minimum width of the Riparian Reserves would be 300 feet slope distance (600 feet total, including both sides of the critical habitat) which is inclusive of all designated or proposed critical habitat considered in this BA. In most NWFP provinces, it would be wider than the 300 feet due to the other criteria used to define the appropriate Riparian Reserve prescription.

Under the ACS, a project cannot have a negative impact, in the long term, on riparian-dependent resources or ecological processes in the Riparian Reserves at the watershed scale. Each project must maintain or restore the physical and biological processes required by riparian dependent-resources at the watershed scale or broader to comply with the ACS. S&Gs prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of the ACS objectives. The ACS objectives address all of the physical and biological features that are essential to the conservation of bull trout (e.g. primary constituent elements) or anadromous fish (e.g. essential features) (Table 19).

The potential, site-specific effects from the continued implementation of the RMPs on the critical habitats will be evaluated in second level project analyses at the time such actions are proposed. Table 19. The NWFP ACS objectives addressing the physical and

biological features of Primary Constituent Elements and Essential Features of Critical Habitat.

Generic Category of Physical and Biological Features of Primary Constituent Elements and Essential Features of Critical Habitat	Primary Constituent Elements or Essential Features of Critical Habitat			Aquatic Conservation Strategy Objectives
	Bull Trout DPSs	Snake River Salmon ESUs	Sacramento River Winter-run Chinook ESU	
Water Quantity	1, 5, 6, 7	3, 9	3, 7	1, 3, 4, 5, 6, 7, 8, 9
Water Temperature	2, 7	4, 8	4	2, 4, 8, 9
Cover/Shelter	3	6, 8, 10	5, 6	1, 3, 5, 6, 8, 9
Substrate	4	1	2	1, 2, 4, 5, 6, 9
Natural Hydrograph	5	5	3, 7	2, 3, 4, 5, 6, 7, 9
Water Quality	1, 4, 5, 6	2	2, 5	1, 3, 4, 6, 7, 9
Migratory Corridor/ Safe Passage Conditions	7	10	1, 7	1, 2, 3, 4, 6, 8, 9
Food/Prey	8	7	5, 6	1, 4, 6, 8, 9
Water Velocity	3	5	3, 7	2, 3, 4, 5, 6, 7, 9
Riparian Vegetation	Not Applicable	8	6	1, 2, 3, 4, 5, 6, 8, 9
Space	1, 3, 4	3	3, 6	1, 3, 4, 5, 6, 7, 8, 9
Predation/Competition/Interbreeding	9	10	4, 7	1, 4, 9

There is an ESA consultation and conference requirement with USFWS or NOAAF to ensure that actions the FS or BLM authorize, fund, or carry out do not adversely modify critical habitat. Currently, the FWS and/or NOAAF Matrix of Pathways and Indicators is used in every 7(a)(2) consultation to assess the effects of a proposed action on habitat important to listed fish species. The habitat indicators in the Matrix of Pathways and Indicators are nearly identical to the physical and biological features addressed by the PCEs and essential features of critical habitat. Although, some PCEs and essential features are not directly identified in the "Matrices," they are indirectly addressed by the existing indicators. All of the PCEs or essential features have been and will continue to be indirectly or directly assessed using the "Matrices" or alternative analysis tools such as the draft "Analytical Process for Development of Biological Assessments for Consultation on Federal Actions Affecting Fish Proposed or Listed under the Endangered Species Act within the Northwest Forest Plan Area" being developed by a federal interagency team, in consultations on the listed species.

The NWFP ACS provides special management to assure the PCEs and essential features of proposed or designated critical habitat are maintained or restored. Land management

activities such as timber harvest, livestock grazing, road construction, barriers associated with roads, restoration and mining require special management that is provided by the ACS. It is discussed previously in this section of the BA as well as the Effects section (subsections 6.1.1.1 and 6.1.1.2) for the species that addresses all of the ACS components and the S&Gs associated with the aforementioned land management activities.

Proposed Critical Habitat for Bull Trout

Section 7 of the ESA prohibits actions funded, authorized, or carried out by Federal agencies from jeopardizing the continued existence of a listed species or destroying or adversely modifying the listed species' critical habitat. Actions likely to "jeopardize the continued existence" of a species are those that would appreciably reduce the likelihood of the species' survival and recovery (50 CFR 402.02). Actions likely to "destroy or adversely modify" critical habitat are those that would appreciably reduce the value of critical habitat for the survival and recovery of the listed species (50 CFR 402.02). Common to both definitions is an appreciable detrimental effect on both survival and recovery of a listed species. Given the similarity of these definitions, actions likely to destroy or adversely modify critical habitat would almost always result in jeopardy to the species concerned when the habitat is occupied by the species. Since the consultation regarding the effects of the RMPs on listed bull trout was non-jeopardy (USDI 2000) within the NWFP area, we can conclude the RMPs are not likely to destroy or adversely modify proposed critical habitat when occupied by bull trout. Additional analysis of the unoccupied habitat would be needed to draw a conclusion for proposed critical habitat in its entirety.

In the FWS BO for the RMPs (USDI 2000), the analysis of the RMP effects on the bull trout included where bull trout occurred both presently and historically. The non-jeopardy conclusion didn't include the unoccupied habitat for bull trout, but the effects analysis addressed all habitat whether occupied or not. The proposed critical habitat for the Columbia and Klamath River bull trout DPSs within the NWFP area is a subset of the occupied and unoccupied habitat analyzed in the BO for the RMPs. Given the similarity of definitions discussed above and an analysis of RMP effects on the species that included both occupied and unoccupied habitat, we can conclude that the analysis and conclusions of the BO for the species will be similar for the proposed critical habitat.

The BO for the NWFP RMPs (USDI 2000) analyzed the effects from land allocations adjacent to Riparian Reserves. The FWS assessed the risk of adverse effects from upland land allocations on habitat presently and formerly occupied by bull trout. Although the entire present and historical distribution of bull trout is within the protective Riparian Reserve land allocation, some moderate risks of indirect adverse effects were identified for actions occurring in upland areas. The FEMAT report (USDA et al. 1993) and the FWS BO for the for alternative 9 (the selected alternative) of the Final Supplemental Impact Statement on *Management of Habitat for Late-Successional and Old Growth Forest related Species within the Range of the Northern Spotted Owl* (USDA and USDI 1994a) portray these risks differently.

The risk ratings of the upland land allocations in the BO do not fully account for the protections associated with the LSRs and the Riparian Reserves, which overlay all land allocations. Certain upland land allocations (LSRs, Managed LSRs in or outside Key Watersheds, AMA, and Matrix) were all rated as having a moderate risk to bull trout habitat and populations. The term "moderate" implies there is more than a minimal risk to fish habitat and bull trout populations from Federal land management activities in the NWFP area. Given the protective measures of the ACS and that upland land allocations are not adjacent to fish habitat, the effects from land management activities in these land allocations including Matrix to bull trout habitat should be fairly low. The BO assigns the same level of risk to LSRs as to Matrix lands, which fails to acknowledge the fundamental difference in objectives, restrictive S&Gs, and level of management activities allowed in the LSRs. The FEMAT report indicated a very low risk to bull trout from the implementation of the NWFP, and on page V-32, recognized the LSRs as relatively undisturbed areas that are an important component of the ACS even though they were not derived as such (USDA et al. 1993).

The FWS BO (USDI 1994) for alternative 9 (the selected alternative) of the Final Supplemental Impact Statement on *Management of Habitat for Late-Successional and Old Growth Forest related Species within the Range of the Northern Spotted Owl* (USDA and USDI 1994a) addressed effects to the listed Lost River and shortnose suckers and partially supports the above conclusion. It analyzed how the ACS components, objectives, land allocations and standard and guidelines generally affected the fish habitat and species. It concluded that the ACS riparian reserves in combination with other land allocation reserves "would provide a high level of protection for all streams in them." The conclusion was, "… based on the assumption that following watershed analysis, the boundaries of Riparian Reserves, particularly in intermittent streams, could change and some management actions would be allowed within them. However, it was also assumed that watershed analysis would not always reduce the final riparian reserve boundaries and that management activities allowed within them would be limited to activities designed to achieve riparian and aquatic habitat objectives."

Furthermore, the BO stated, "Several causes for the decline of Lost River and shortnose suckers are addressed by the preferred alternative. They are insularization of habitat and water quality problems associated with timber harvest, removal of riparian vegetation, and livestock grazing. Riparian Reserves in combination with other Reserves such as CRAs and LSRs provide a high level of protection for all streams in them. This in turn provides the ecological functions and processes required for the amelioration of these causes and thus the creation and maintenance of fish habitat. Additionally, streams in reserves could serve as cores of good habitat. The core areas would serve as refugia and population centers for recolonization as degraded areas recovered in the future." The threats discussed for the suckers are also two of the primary threats to bull trout. It is reasonable to assume the FWS conclusions regarding the NWFP ACS, its benefits to fish habitat and recovery of the suckers, would apply to other inland fish habitat and species such as bull trout.

The NWFP land allocations in the RMPs indirectly provide protection for bull trout and critical habitat since the majority of the FS and BLM lands pose a low or no potential for adverse effects. The FWS bull trout BO for the RMPs (USDI 2000) identified the following land allocations as low or no risk to bull trout: Congressionally Reserved, Administratively Withdrawn, and LSRs in Key Watersheds. These three land allocation areas encompass 64%, 77% and 84% of the occupied habitat for the Columbia, Klamath and Puget Sound/WA Coast bull trout DPSs, respectively (USDI 2000). Regarding unoccupied habitat for the Columbia and Klamath bull trout DPSs, these land allocation areas encompass 58% and 80% of the area, respectively (USDI 2000). All other land allocations were identified as a moderate potential for adverse effects except for Riparian Reserves. However, the BO doesn't account for the Riparian Reserves of those land allocations since the Riparian Reserves were not mapped for the NWFP FSEIS.

The Riparian Reserves land allocation was determined for the NWFP FEIS through a series of samples in the NWFP provincial areas (USDA and USDI, 1994a). These samples were taken only in the Matrix land allocation area and resulted in an estimated 39% of the NWFP Matrix lands being comprised of Riparian Reserves. Using this series of samples, it is estimated the other NWFP land allocations within the Olympic Peninsula, WA Western Cascades, OR Western Cascades, WA Eastern Cascades and OR Eastern Cascades physiographic provinces are comprised of an average of 46%, 35%, 27%, 31%, and 15% Riparian Reserves, respectively (USDA and USDI 1999). However, FS and BLM analyses of Riparian Reserve land allocations have determined the NWFP FEIS underestimated the Riparian Reserve area of some provinces, especially the OR and WA Coastal areas, by as much as 74 % (USDA and USDI 1999, USDA and USDI 1997a, USDA and USDI 1997b). Accounting for the riparian reserve area of the land allocations in the FWS BO would substantially reduce the FS and BLM land area posing a potential moderate risk to bull trout and proposed critical habitat.

Critical Habitat for Anadromous Fish ESUs

The effects of RMPs on critical habitat for six anadromous fish ESUs (Sacramento River winter-run chinook salmon; Snake River fall-run chinook; Snake River spring/summer-run chinook; Snake River sockeye salmon; Southern Oregon/Northern California Coast coho salmon; and Central California Coast coho salmon) considered in this BA are addressed two ways. First, although the effects of the RMPs on the critical habitat for the Southern Oregon/Northern California Coast and Central California Coast coho salmon ESUs would be adequately addressed in section 6.2.1 in this BA, those effects were previously addressed in consultations with NOAAF (Table 3). The analysis and conclusions of those two BOs are hereby incorporated by reference (USDC 1999, USDC 2001) and no additional analysis is conducted herein. Second, the RMPs effects on the critical habitat of the remaining four ESUs had not been previously analyzed and are addressed in the effects common to all critical habitat (section 6.2.1) of this BA.

CUMULATIVE EFFECTS

The States within the range of the NWFP have developed, or are engaged in developing, conservation plans or strategies for the listed salmonid species. The federal NWFP ACS effort has been boosted by the Oregon and Washington State efforts to protect and recover habitat important to the at-risk fish species on nonfederal land. Companion aquatic conservation strategies for nonfederal lands are necessary to accompany the federal NWFP ACS to significantly accrue benefits for ensuring the viability of fish species and increase the likelihood of NWFP ACS success (USDA et. al. 1993). The States of Oregon and Washington have developed Salmon Recovery Strategies but the Oregon State strategy is more comprehensive since it applies to all wild salmonid species.

Oregon. The State of Oregon developed a comprehensive aquatic conservation strategy (The Oregon Plan) with components complementary to the NWFP ACS*:* In 1997 the Oregon Coastal Salmon Restoration Initiative was renamed the Oregon Plan for Salmon and Watersheds and was broadened to steelhead populations of the Oregon coast and Lower Columbia including Willamette River. On January 14, 1999, Governor Kitzhaber expanded the Oregon Plan for Salmon and Watersheds (Oregon 1997) to include all at-risk wild salmonids throughout the State. This Executive Order provides the framework and direction for state agencies to implement, to the extent of their authorities, the Oregon Plan in a timely and effective manner.

The goal of the Oregon Plan is to "restore populations and fisheries to productive and sustainable levels that will provide substantial environmental, cultural, and economic benefits." Components of this plan include (1) coordination of efforts by all parties, (2) development of action plans with relevance and ownership at the local level, (3) monitoring progress, and (4) making appropriate corrective changes in the future. This process included chartering 84 locally-formed and represented “watershed councils” across the State. Membership on the watershed councils includes: landowners, businesses interests, agricultural interests, sport fishers, irrigation/water districts, individuals, State, Federal, and Tribal agencies, and local government officials.

Since 1990, the State of Oregon has taken several actions to address the conservation and recovery of bull trout. Initially, working groups were established that consisted primarily of State, Federal, and private individuals with bull trout expertise. After gathering initial information, membership on the working groups was expanded when the Oregon Department of Fish and Wildlife bull trout coordinator was hired in 1995, and included a range of people representing affected interests. Information on watershed conditions prepared by local councils and working groups has been applied to developing bull trout recovery unit chapters in Oregon.

More restrictive harvest regulations were implemented beginning in 1990; by 1994 the harvest of bull trout was prohibited throughout the State with the sole exception of Lake Billy Chinook in central Oregon. Bull trout working groups have been established in the Klamath, Deschutes, Hood, Willamette, Odell Lake, Umatilla and Walla Walla, John

Day, Malheur, and Pine Creek river basins for the purpose of developing bull trout conservation strategies. The Oregon Department of Fish and Wildlife reduced the stocking of hatchery-reared rainbow trout and brook trout in areas where bull trout occur, and genetic analysis for most bull trout populations was completed in 1997. Angler outreach and education efforts were also implemented in river basins with bull trout. Bull trout identification posters were placed at various campgrounds and trail heads, and bull trout identification cards were produced for distribution by the Malheur National Forest and the Oregon Department of Fish and Wildlife. Research to examine life history, genetics, habitat needs, and limiting factors of bull trout in Oregon was initiated in 1995, supported by funding from the Fish and Wildlife Program of the Northwest Power Planning Council. In 1998, a project was initiated to transfer bull trout fry from the McKenzie River watershed to the adjacent Middle Fork Willamette River, which is historical unoccupied, isolated habitat. Recent surveys documented several age classes of bull trout at release sites in the Middle Fork Willamette River.

The Oregon Department of Environmental Quality sets standards for water quality and administers Oregon's water quality program. Surface water temperatures may not exceed 10.0 degrees Celsius (50.0 degrees Fahrenheit) in waters that support or are necessary to maintain the viability of bull trout (Oregon 1996).

Washington. Washington State has developed a salmon restoration strategy while the State legislature and agencies have taken progressive actions to protect and recover at-risk fish populations and habitat. The draft Statewide Strategy to Recover Salmon, Extinction is not an Option, was produced by the Washington Governor's Salmon Recovery Office (Washington Governor's Salmon Recovery Office 1999) and Joint Natural Resources Cabinet. The plan describes how State agencies and local governments will work together to address habitat, harvest, hatcheries, and hydropower as they relate to recovery of listed species. While the Washington Governor's plan focuses primarily on salmon, many of the same factors affecting salmon also impact bull trout.

Overall goals and strategies identified in the State salmon recovery strategy for restoring healthy populations of salmon are consistent with actions needed for bull trout recovery. Therefore, it served as the template for recovery unit chapters in the Washington portion of the bull trout recovery plan. In addition, the Washington Department of Fish and Wildlife prepared the Washington State Salmonid Inventory for Bull Trout/Dolly Varden (WDFW 1998) and the Bull Trout and Dolly Varden Management Plan (WDFW 2000) which the bull trout recovery teams considered in the development of the draft recovery plan for the Columbia River bull trout DPS.

The Washington State legislature established the Salmon Recovery Act (ESHB 2496) and Watershed Management Act (ESHB 2514) to assist in salmon recovery efforts. The Watershed Management Act provided funding and a planning framework for locally based watershed management addressing water quality and quantity. The Salmon Recovery Act provides the direction for the development of limiting factors analyses on salmon habitat and creates a list of prioritized restoration projects at the major watershed

level. While not specifically targeting limiting factors for bull trout, these documents have played an important role in the development of bull trout recovery unit chapters.

The Washington Department of Fish and Wildlife no longer stocks brook trout in streams or lakes connected to bull trout waters. Fishing regulations prohibit harvest of bull trout, except for a few areas where stocks are considered "healthy," within the State. The Washington Department of Fish and Wildlife is also currently involved in a mapping effort to update bull trout distribution data within the State of Washington, including all known occurrences, spawning and rearing areas, and potential habitats. The salmon and steelhead inventory and assessment program is currently updating their database to include the entire State, which consists of an inventory of stream reaches and associated habitat parameters important for the recovery of salmonid species and bull trout.

In January 2000, the Washington Forest Practices Board (2000) adopted new emergency forest practice rules based on the "Forest and Fish Report" development process. These rules address riparian areas, roads, steep slopes, and other elements of forest practices on non-Federal lands. Although some provisions of forest practice rules represent improvements over previous regulations, the plan relies on an adaptive management program for assurance that the new rules will meet the conservation needs of bull trout. Research and monitoring being conducted to address areas of uncertainty for bull trout include protocols for detection of bull trout, habitat suitability, forestry effects on groundwater, field methods or models to identify areas influenced by groundwater, and forest practices influencing cold water temperatures. The Forest and Fish Report development process relied on broad stakeholder involvement and included State agencies, counties, Tribes, forest industry and environmental groups. A similar process is also being used for agricultural communities in Washington and is known as "Agriculture, Fish, and Water."

California. Since implementation of the NWFP and its ACS began on federal lands nearly 10 years ago, California State and local agencies and other groups have been involved in many aspects of salmon and steelhead conservation and recovery. California Department of Fish and Game (CDFG) completed a Steelhead Restoration and Management Plan in 1996 (CDFG 1996) and has recently completed coho salmon status reviews in response to listing petitions under the California ESA. These status reviews have set the stage for salmon recovery, and include data regarding current baseline, reasons for decline, and extinction risk for nearly all anadromous salmonids in California.

Sport and commercial salmon harvest regulations under the CDFG have changed significantly since 1994, with emphasis on increasing salmon spawning recruitment, reducing habitat disturbance, and increasing juvenile-to-smolt survival rates. Most anadromous systems are closed to fishing during April and May to protect redds, newly emerged larvae, and emigrant juveniles. Also, most tributaries of anadromous rivers are either closed to angling year-round, or have catch-and-release restrictions, to further protect salmon during their freshwater phase. Bait restrictions in most rivers include single barbless hooks for catch and release and uses and origins of roe.

During the completion of status reviews and the statewide Steelhead Restoration and Management Plan, NOAAF and CDFG entered into an MOU that included new guidelines for operating salmon and steelhead hatcheries. These new practices are aimed at protection of genetic diversity, significantly reducing the potential for hatchery/wild spawning interactions, maintaining wild populations in light of angling pressure, and preventing further "domestication" of remaining wild stocks. The MOU includes restrictions on timing and location of releases, addresses problems with "outplantings", disease transfer from hatcheries to wild populations, and hatchery fish marking practices. The new practices outlined in the MOU are based on findings from current conservation genetics research.

Many groups have contributed to watershed restoration and salmon recovery efforts in California. Large grant programs sponsored by CALFED Bay-Delta Program and CDFG have funded watershed and fisheries restoration projects across the NWFP area. County and state transportation agencies have been working to restore fish passage on streams blocked by road culverts. California forest practice rules have been improved to provide added protection for Sensitive watersheds and require development of timber harvest plans to prevent deleterious effects to streams on private lands. CDFG is in the process of reviewing their suction dredging regulations and may change them to provide added protection for salmonids that were federally listed after the current regulations were developed. Many NWFP watersheds now have community based groups that are implementing restoration actions. Some large river basins, such as the Klamath and Trinity, have multi-agency restoration task forces.

DETERMINATION OF EFFECT

The RMPs either incorporate or were amended by the NWFP except for the CRGNSA as previously noted. The NWFP and its ACS are designed to conserve aquatic and riparian habitats and the species which are dependent on those habitats. This BA has explained the Aquatic Conservation Strategy, its component parts, its ecosystem management approach, and the conclusion of the NWFP FEMAT in predicting an 80% or greater likelihood of providing sufficient aquatic habitat to support stable, well distributed populations of salmon and trout species should the NWFP be implemented (USDA et al. 1993). The BA provides data and interpretation to strongly support the premise that the administrative units have been implementing the NWFP and its components as part of RMP implementation.

The components of the ACS are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. The components and their potential effects to ESA-listed fish species were described by component in the effects section (Section 6.1.1.1). In concert with the land allocations and S&Gs, the ACS components provide a framework to minimize or avoid adverse effects of land management actions while also restoring watershed processes and habitat characteristics so that fish populations have a high potential to be maintained over time. The goal of

conserving at-risk fish populations for the long-term was integral to development of the ACS. The network of Key Watersheds to provide refugia for fish populations was a direct outcome of that goal. The Key Watersheds have restrictive S&Gs to maintain or improve conditions suitable as refugia. The S&Gs prohibit road construction in RARE II roadless areas, reduce overall road mileage, require WA prior to all but minor activities, require WA prior to timber harvest and Key Watersheds are highest priority for watershed restoration.

The structure of the NWFP focuses the more potentially impacting land management actions such as regeneration timber sales and associated road construction in upland areas, primarily in the Matrix land allocation. Even in Matrix, ground-disturbing actions are dispersed in time and space, and projects are designed to minimize environmental impacts. In addition, the land base for such activities has been greatly reduced, with 80% or greater of the federal land within the NWFP area in some form of reserve land allocation. In the reserve land allocations, ground-disturbing actions are prohibited, reduced in size and scope, and/or designed in the context of information from the results of WA and strict S&Gs which protect riparian and/or terrestrial resources. Some of the S&Gs that are designed to conserve terrestrial resources such as wildlife indirectly benefit riparian-dependent resources by minimizing ground disturbance and the potential for soil erosion. The large proportion of federal land area in some form of reserve status also provides benefits by the process of passive restoration, where vegetation growth reduces erosion and provides shade for stream networks. Passive restoration also occurs when stream channels interact with encroaching vegetation, natural introductions of large wood debris and bedload processes to build stream banks, narrow channels, form pools, and sort and store sediments from bedload.

The expansive network of wide Riparian Reserves overlaying all other land allocations, including Matrix, benefits ESA-listed fish species and their habitat by providing buffer areas from the effects of upland land management actions as well as being sufficiently wide to maintain watershed processes. Actions that take place within the Riparian Reserves are designed with the following in mind: "Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special S&Gs apply (USDA and USDI 1994b, page B-12)." These S&Gs prohibit and regulate activities that retard or prevent attainment of the ACS objectives. WA must be completed before timber harvest activities can take place within Riparian Reserves, providing context for the design and potential effects of such proposed actions on riparian-dependent resources such as ESA-listed fish species. The Riparian Reserves are often the focal point for watershed restoration, to actively restore and enhance conditions suitable for long-term conservation of ESA-listed fish species.

Watershed analysis provides a basis for understanding the baseline conditions, trends, and ranges of natural variability for watershed processes and aquatic habitat conditions in the context of habitat requirements for local fish species. WA also typically provides information on the distribution of fish species and may identify important habitat areas and abundance data or trends. The results of WA provide a context for prioritizing restoration and other land management actions, and informs decisions on where, when,

and in what manner to accomplish them. As described above, WA is integrated with management for Key Watersheds and Riparian Reserves because it is required prior to doing specific types of activities.

Implementation and effectiveness monitoring in support of the NWFP ACS will determine if the land management agencies are properly applying the ACS and whether or not such implementation is resulting in anticipated conditions in watersheds. While effectiveness monitoring may not result in an understanding of trends in condition for ten or more years, an assessment of compliance with the components of the ACS and associated S&Gs is used for adaptive management purposes in the near term.

The NFP FSEIS, NFP ROD and the FEMAT report support the conclusion that the ACS components are sufficient to maintain and restore riparian and aquatic ecosystems and attain ACS objectives:

"Although Riparian Reserve boundaries may be adjusted on permanently-flowing streams, the prescribed widths are considered to approximate those necessary for attaining Aquatic Conservation Strategy objectives." (USDA and USDI 1994b at B-13).

"The total system of withdrawn and reserved areas, along with the specified standards and guidelines, would meet the need to protect the overall ecosystem while providing for other management opportunities." (USDA and USDI 1994a at F-62);

"The total system of Key Watersheds, along with Riparian Reserves and the specified standards and guidelines, will meet the need to protect the overall aquatic ecosystem while providing for other management opportunities." (USDA and USDI 1994a at F-64).

"Ecological conditions and processes required for the creation and maintenance of fish habitat were provided by Riparian Reserves. The greater the amount of Riparian Reserves, the more it contributed to the ranking." (USDA et al. at 1993 V-64).

"In all cases we assumed final Riparian Reserves would provide the necessary range of ecological functions and processes that create and maintain good fish habitat." (USDA et al.1993 at V-64).

Given the land allocations, the amount of land area in reserves, the distribution in time and space of actions such as regeneration timber harvest in upland areas (Matrix) which constitute 20% or less of the total land area in the NFP planning area, watershed restoration actions, and natural and facilitated growth of forest vegetation, a picture emerges for forest, riparian and aquatic conditions that will develop over time on federal lands as the NFP is implemented. Regeneration harvest in the Matrix is planned for rotations of 80 years or greater. If evenly distributed over time and space, approximately 1.25% of the federal land area in the Matrix would be disturbed in a given year in a fifth field watershed. Riparian Reserves, LSRs, congressionally withdrawn areas, and other types of reserves which constitute as much as 80% of the land area will grow towards late-successional characteristics where soil, climate conditions and infrastructure allow it.

Sediment and hydrological processes would move towards reference conditions. Fish habitat conditions would improve in concert with maturation of riparian vegetation, and reductions in sediment load and peak/base flow fluctuations. Natural disturbances such as fires, windstorms and floods may alter conditions periodically, but in the long-term, aquatic and riparian conditions would move towards reference conditions on federal lands.

In summary, the integration of the ACS components of WA, Key Watersheds, Riparian Reserves, watershed restoration, and associated S&Gs results in a management framework that minimizes or avoids the potential negative impacts of land management actions to water quality and fish habitat, while also restoring aquatic and riparian habitat conditions. This will enhance the long-term potential to sustain populations of at-risk fish species. Consequently, the ACS as a strategy and its individual components are beneficial to ESA-listed fish species and critical habitat.

The BA has explained the results of NWFP regional implementation monitoring reports which indicate a high rate of compliance with S&Gs. The monitoring reports also indicate that the administrative units are reducing road networks in Key Watersheds and elsewhere, further enhancing their value as refugia. Watershed Analysis has been conducted for nearly all of the acreage contained in Key Watersheds, and has substantially been completed in non-Key Watersheds. This has and will continue to provide relevant information to provide context for the design of activities, and where to focus restoration efforts. Watershed restoration efforts are widespread and have restored or enhanced watershed processes and habitat important for the well-being of ESA-listed fish species. There have been limited and site-specific changes to the Riparian Reserve network. Based upon the experience of several administrative units, the Riparian Reserve network actually comprises more of the landscape than originally estimated. Largely for this reason, the Probable Sale Quantity for timber harvest has been reduced. Furthermore, continued implementation and effectiveness monitoring will facilitate an adaptive management process and determine whether changes in land allocations or S&Gs are needed in the future.

A high percentage of the present distribution of ESA-listed or candidate fish species occurs in land allocations where S&Gs provide substantial protection for the species and proposed or designated critical habitat. Approximately 80% of the land area in the NWFP has some form of reserve status. This will reduce the risk of adverse effects from management activities.

Implementation of the S&Gs, land allocations, and other components of the Aquatic Conservation strategy, should result overall in improved baseline conditions over time, further reducing the frequency, magnitude and duration of adverse effects on the species and proposed or designated critical habitat.

Protective land allocations, watershed restoration activities, and improved environmental conditions should result in positive effects on the reproduction, numbers and distribution of ESA-listed or candidate species in the NWFP area over time.

Each action or programmatic category of actions proposed by the action agencies in implementing their RMPs that require ESA Section 7 consultation will continue to utilize the streamlined consultation procedures, including the use of interagency Level 1 and Level 2 teams.

As described earlier in the document, a wide variety of actions take place as the administrative units implement their RMPs. Despite the protective and restorative aspects of NWFP and ACS implementation, a sub-set of actions will nevertheless result in adverse effects to ESA-listed and candidate fish species and proposed or designated critical habitats. These adverse effects are typically short-term in nature and often associated with watershed restoration efforts. Therefore, most of the RMPs "may affect, likely to adversely effect" (LAA) the species or critical habitat specific to an RMP area as identified in Table 2. The effect determinations for the continued implementation of the individual RMPs as amended by the NWFP and Preferred Alternative A of the ACS FSEIS (USDA and USDI in press) on the following generalized categories of species or critical habitat: listed species, designated critical habitat, proposed critical habitat and/or candidate species (Table 20). The Modoc and Lassen NF are the only RMPs that have "no effect" (NE) to any of the species or critical habitat within the NWFP area as determined in this BA (Table 20).

Table 20. Determination of effect for the continued implementation of the RMPs as amended by the NWFP ACS and Preferred Alternative A of the ACS FSEIS on the following generalized categories of species or critical habitat: listed species, designated critical habitat, proposed critical habitat and/or candidate species. The actual listed species, designated critical habitat, proposed critical habitat, or candidate species specific to a RMP area, to which the effect determinations of the generalized categories apply, are listed in Table 2. The acronyms NE and LAA represent the phrases "no effect" and "may effect, likely to adversely affect", respectively.

Administrative Unit	Effect Determination			
	Listed Species	Designated Critical Habitat	Proposed Critical Habitat	Candidate Species
Columbia River Gorge NSA	LAA	LAA	LAA	LAA
Deschutes	LAA	NE	LAA	NE
Gifford Pinchot	LAA	NE	LAA	LAA
Klamath	LAA	LAA	NE	NE
Lassen	NE	NE	NE	NE
Mendocino	LAA	LAA	NE	LAA
Modoc	NE	NE	NE	NE
Mount Baker Snoqualmie	LAA	NE	NE	LAA
Mount Hood	LAA	NE	LAA	LAA
Okanogan	LAA	NE	LAA	NE
Olympic	LAA	NE	NE	LAA
Rogue River	LAA	LAA	NE	NE
Six Rivers	LAA	LAA	NE	NE
Siskiyou	LAA	LAA	NE	LAA
Shasta-Trinity	LAA	LAA	NE	LAA
Siuslaw	LAA	NE	NE	LAA
Umpqua	LAA	NE	NE	LAA
Wenatchee	LAA	NE	LAA	NE
Willamette	LAA	NE	LAA	NE
Winema	LAA	NE	LAA	NE
Arcata	LAA	LAA	NE	NE
Coos Bay	LAA	LAA	NE	LAA
Eugene	LAA	NE	LAA	LAA
King Range NCA	LAA	LAA	NE	NE
Klamath Falls	LAA	NE	NE	NE
Medford	LAA	LAA	NE	LAA
Redding	LAA	NE	NE	LAA
Roseburg	LAA	NE	NE	LAA
Salem	LAA	NE	NE	LAA
Ukiah	LAA	LAA	NE	NE

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APPENDIX

Current Processes Used by the Action Agencies that Contribute to a Multi-Scale Understanding of Effects

Current Processes Used by the Action Agencies that Contribute to a Multi-Scale Understanding of Effects

This paper identifies the processes that the USDI Bureau of Land Management (BLM) and the USDA Forest Service (FS) use to assess and mitigate effects of actions at a variety of scales. Analysis processes and other requirements are listed below and a summary of how they interact follows.

Project NEPA Analysis

The National Environmental Policy Act (NEPA) requires full disclosure of the direct and indirect effects of federal actions, as well as public participation in the process. This process shapes project design by the requirement to evaluate alternatives for a proposed action. The ultimate design of a project is frequently influenced by comments from the public and from agencies such as the federal environmental Protection Agency, and state Fish and Wildlife agencies.

Interdisciplinary team members assess the effects of the alternatives on their particular areas of expertise. A variety of information sources are used, including Watershed Analysis (WA) (typically at the 5th field HUC scale), habitat inventory and monitoring data (such as stream surveys and data from recording thermographs), field assessments of conditions within the project area, and state and federal agency assessments of fish population distribution and population status. These information sources provide data at a variety of scales from site (important spawning areas and presence/absence for fish; sediment sources to streams, site habitat conditions), stream reach (Section 303d water quality limited stream sections) to watershed or greater (population status, extent of distribution of special status fish species). Baseline conditions are utilized in the analysis process. NEPA analyses are not at specific spatial scales; the scale is dependent upon the action area and the nature and magnitude of the potential effects. There is a requirement in NEPA to evaluate cumulative effects. Cumulative watershed effects are typically assessed using models, at scales ranging from 7th field HUCs to 5th field HUCS.

The NEPA analysis often results in the selection of mitigation measures including Best Management Practices to be applied to the action to mitigate water quality concerns. All projects must meet the implementing regulations of the Clean Water Act and other laws and regulations. Both the FS and BLM have manuals that provide direction on actions and coordination. If the project is contracted, the contract also contains a variety of clauses that mitigate for undesirable impacts. Contract inspectors and Contracting Officer's Representatives ensure the specifications and clauses are met. Forest Plans (FS) and Resource Management Plans (BLM) contain standards, designed to protect water quality, that must be met in project design and implementation.

Effects analysis in a NEPA document will indicate whether implementing a project may impact a site, and will characterize the intensity and duration of the effect. Managers must consider these effects given the existing condition of the watershed and the potential cumulative effects. Managers must also make a finding of consistency with the unit's Land and Resource Management Plan (under NFMA) or make a finding of Resource Management Plan conformance (under FLPMA). Since the ACS is either integrated into the LRMPs/RMPS or they were amended by it, this finding of consistency or conformance with the plans is a consistency finding for the ACS.

For most projects, the NEPA analysis process includes an appeal/protest stage. Appeals and protests may challenge the adequacy of analysis of environmental effects analysis. The outcome of appeals and protests may include additional analysis for effects and may influence the design of projects. Litigation on NEPA decisions may also challenge the adequacy of analysis. Litigation may also ultimately result in design changes for proposed actions.

Project Section 7 Endangered Species Act Consultation

Federal agencies are required to comply with Section 7 of the Endangered Species Act (ESA). ESA consultation takes place when there are proposed or listed species or designated/proposed critical habitat present. The action agencies consult with the Fish and Wildlife Service (FWS) or the National Oceanic and Atmospheric Administration Fisheries (NOAAF), depending upon the fish species.

The action agencies have manual requirements and follow the implementation regulations (Code of Federal Regulations) in preparing Biological Assessments (BAs). The BAs also conform to analytical process formats developed by the FWS and NOAAF. The current formats evaluate effects to listed species or critical habitat at a variety of scales, from site to watershed, by habitat indicators. The determination of effects is dependent upon specific site and watershed physical and biological baseline conditions for a proposed action and the design and anticipated effects of the action itself. The four agencies (FWS, NOAAF, BLM and FS) have developed a draft analytical procedure for Section 7 ESA consultation on listed fish species and critical habitat that is currently being evaluated on several test projects. It assesses for impacts at multiple scales, from site to watershed. Key features of the draft process are:

1) More closely integrates the use of Watershed Analysis (WA) results, the NEPA analysis and the ESA consultation process;
2) Specific identification and documentation of the effect by what part of the proposed action is causing it, what life history stage of the fish is being affected, and eight factors of the effect (nature, proximity, timing, duration, probability, frequency, distribution, and magnitude);
3) Tracking effects on the landscape of previous federal actions and current proposed actions to determine aggregated effects, at the scale of watersheds

The four agencies conduct ESA consultation using the "Streamlined Consultation Procedures for Section 7 of the Endangered Species Act" (USDA et al. 1999) which is an interagency agreement. It established a hierarchy of teams from project-level consultation teams, known as Level 1 teams, to higher level teams for elevations of disputes. The Level 1 teams evaluate BAs and effect determinations. If formal consultation is required, the teams discuss what will be presented in Biological Opinions for terms and conditions. The terms and conditions are mandatory requirements for the action agencies to follow. The regulatory agencies are encouraged to participate in early phases of project development. This can result in design changes to projects.

A potential outcome of ESA consultation is a "Jeopardy" determination and/or a finding of "Adverse Modification" of critical habitat. These are rare because the streamlining process and the requirements of the action agencies to follow multiple laws, policies, standards and guidelines in the Plans, respond to public comments, resolve protests/appeals during the NEPA process, and resolve litigation, generally do not result in projects with such impacts moving forward to ESA consultation. Jeopardy or Adverse Modification finding would result in deferral or modification of project designs.

Project "Design Criteria" are also a feature of some ESA consultations. Action agencies identify design "sideboards" in discussions with their Level 1team regulatory agency counterparts to minimize adverse effects of actions to listed fish or critical habitat. Design criteria are often developed for programmatic consultations, where entire programs of work such as road maintenance or habitat restoration are consulted on as a whole.

Project Magnuson/Stevens Act consultation

Amendments to the Magnuson-Stevens Fishery Management and Conservation Act (MSA) in 1996 required the identification of all habitats essential to federally-managed fishery species and implementation of measures to conserve and enhance this habitat. The amendments also required federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH) of federally-managed commercial fishery species. This requirement became effective on September 27, 2000 when Amendment 14 to the Pacific Coast Fishery Management Plan for Chinook salmon, coho salmon and Puget Sound pink salmon was developed. Appendix A of that plan defines EFH and displays the geographic extent of it for the salmon species.

The definition of EFH is: A...those waters and substrate necessary to fish for spawning, breeding, or growth to maturity.@ Any project that adversely affects such waters and substrate has an EFH consultation requirement. Therefore, the scope of projects requiring EFH consultations may include those located up slope from stream channels and associated riparian areas. Consultations for EFH salmon species are typically included within Biological Assessments for ESA-listed salmon species and are assessed at site and reach scales. Where there are no ESA-listed salmon species but where there is EFH, the analysis is completed in conjunction with the NEPA analysis.

Analysis to Obtain Permits

Actions requiring permits also require additional analysis and reviews. The analysis provided in the application process for a permit, such as a removal and fill permit for stream channel work, is usually provided by NEPA analysis. External reviews take place by the permit agencies (Army Corps of Engineers, State Lands) prior to issuing permits for the action. Some actions require conformance with State standards, such as fish passage projects. These reviews and analyses are typically for site or reach-scale effects and may result in design changes.

Monitoring and Inventory

Monitoring provides information that influences the design of actions and their effects. Local administrative unit monitoring is variable and responds to LRMP/RMP monitoring questions and specific monitoring requirements of NEPA decisions for projects. Water quality monitoring, pre and post project habitat evaluations, and fish population monitoring such as juvenile fish estimates and spawning surveys over multiple years take place. Northwest Forest Plan (NWFP) implementation monitoring spans the entire NWFP area. A sub-sample of projects is evaluated each year for compliance with Standards and Guidelines and annual reports are prepared. Stream inventories provide information on long-term and project-specific environmental conditions.

The Aquatic and Riparian Effectiveness Monitoring Program (AREMP) is a statistically-based sampling of sixth-field HUC watersheds on an annual basis across the NWFP area. Sites are monitored for physical and biological characteristics. The data is then placed into a model to determine an overall watershed score. The score is placed on a scale from -1 to 1 where a 1 indicates that it is true that the watershed is in good condition. The hypothesis is that if the NWFP and its ACS is effective at restoring habitat and processes that support it over time, the frequency distribution of watersheds will move towards "true" for good condition. Because of the nature of response time at watershed scales to land management activities, and sample size, conclusions about the effectiveness of the NWFP at the scale of the entire NWFP area may not be available for 10 or more years.

Other effectiveness monitoring is in the form of scientific studies. Many studies are funded by the action agencies to evaluate effects of types of land management activities, such as logging and road-building on flow and sediment regimes and the effectiveness of different types of aquatic habitat restoration techniques.

These forms of monitoring and inventory influence the design of projects and also contribute towards an understanding of effects of management actions at various scales.

Summary and Conclusions

The analysis of effects of actions at various scales occurs through a number of different, interrelated, and often integrated, processes. These include NEPA, ESA Section 7 consultation, and EFH consultation. The draft analytical procedures for ESA

consultation integrate the WA aspect of the Aquatic Conservation Strategy with NEPA and project level ESA consultation. This will result in a thorough understanding of environmental impacts and ESA effects at scales ranging from site to watersheds.

The design of projects has been and will continue to be driven by the goals of the NWFP and shaped by land allocations, S&Gs, context provided by relevant information from WA, NEPA analysis (including public participation), mitigations including site-specific Best Management Practices, and the results of the streamlining consultation process during ESA consultation. Projects requiring permits undergo additional analysis and review by other federal and state agencies that may result in design changes. Decision makers will continue to document that projects are consistent with LRMPS/RMPs and therefore the ACS of the NWFP that is integrated in them. Project implementation will continue to be in accordance with NEPA decisions and, where formal ESA consultation is required, with the terms and conditions of BOs.

Monitoring and project administration will continue to evaluate whether or not projects were implemented as designed, in accordance with S&Gs, BMPs, and with contract specifications, and whether or not they are effective in meeting project goals. AREMP will ultimately provide a picture of whether or not the ACS is effective across the NWFP. In the short-term, project level monitoring, research results, and annual implementation monitoring will provide information on the impacts and conformance with "rules" of federal land management agency projects. This information will be used for future project design and administration to minimize adverse environmental impacts and ESA effects.

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